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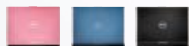
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Editorial



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Seventh time lucky for Microsoft?

The pre-beta version of Windows 7 has just been unveiled, but there's still plenty of time for Microsoft to mess it up

So Windows 7 has made its first tentative steps into public view, with the much-reported launch of a pre-beta version to developers late last month. But unveiling a product at such an early stage of its development is always fraught with danger, and Microsoft seems to have a unique talent for messing up perfectly good software with dismal marketing and promotion.

Two recent examples have been Windows Vista and Windows Home Server. Vista suffered from an overly long development cycle and a mid-life crisis, ending rather bizarrely in what seems to have been a premature launch. Coupled with a disastrously organised upgrade voucher scheme and an overdose of highly priced versions, Vista was wrong-footed from the start. Personally, I still think Vista is a great OS – I use it at home, and I'd happily switch to it in preference to the creaking

licensing is overly restrictive, requiring identical hardware for replacements.

With WHS in particular, Microsoft has also discovered that listening too much to what beta testers say they want can send them down lots of dead-end trails. There's a never-ending list of requests to add this or that functionality, most of which are beyond what the original brief for WHS was intended to provide (that is, to provide an idiot-proof means of backup for home networks). It was never meant to be an email server, an iTunes server, or a website-hosting solution, even though it's technically capable of doing most of these things (see Alan Stevens, *Hands On Networks*, page 148).

But back to Windows 7. I've installed a virtual PC running the pre-beta code handed out by Microsoft, and no doubt you'll see lots of reviews treating it like a shipping product, some even complete with performance benchmarks. This is just plain ridiculous. The pre-beta code (build 6801) uses (almost) the vanilla Vista interface, with few of the goodies that were visible during Microsoft's presentations (see page 17). There's over a year for the code to be tweaked and optimised before shipping, making benchmarking patently pointless. This release is to give developers something to get their teeth into, before the serious beta testing kicks in over the next few months.

From what I can see, Windows 7 will, in effect, be Vista SP3, still based on the Vista/Server 2008 kernel code. If Microsoft does manage to make it snappier on lower spec hardware – which it needs to do if it wants to replace XP in the netbook market – then we'll all be happy. But if it gets all the technical bits right and then blows it all with yet another duff marketing campaign, or a daft geek-driven decision (say, Windows 7 will be 64-bit only!) then it's just going to compound the damage. **PCW**

'There's over a year for the code to be tweaked, so benchmarking is pointless'

copy of XP on my work PC. But many users are obviously comfortable with XP and, unless they're presented with a compelling reason to change, that's what they're going to stick with.

Windows Home Server (WHS) is another product we were bullish about a year ago when it launched. But, once again, it was released in a flawed low-key way and was almost immediately hit by a serious corruption bug that damaged confidence in the product. The recent 30 per cent drop in the price of WHS for system builders seems like a belated cry for help, but I believe the fatal flaw was not offering an official retail DIY version of the product. Buying an OEM version is all well and good, but the

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Microsoft's head in the clouds

Microsoft has spelled out moves which, if successful, could mark a change of direction as big as its famous 1994 about-turn, when it suddenly embraced the web.

Its major announcement at the annual Microsoft Professional Developer Conference seems at first sight to be remote from the concerns of most users. A new operating system – Windows Azure – will allow companies to offload demanding tasks to the company's massive data centres, which are being expanded at an astonishing rate (see page 16).

The advantage for large companies is that they can have vast computing power for short periods, with a virtually limitless capacity for web access, without having to invest a fortune in servers.

Small companies, and even individuals, can benefit by having instant, scalable server power at low start-up costs. "It means a kid working from his bedroom can start something as big as Facebook," said Don Scarfe, chief executive of UK-based Dot Net Solutions, which has developed a program demonstrating the power of Azure.

Microsoft hopes Azure will allow it to dominate this emerging 'cloud

computing' market in the way Windows NT, launched in 1992, wrested control of networks from then dominant Novell. It is less likely to cite the comparison with Bill Gates' belated leap on to the web bandwagon and the crushing of browser pioneer Netscape, which landed the company in an extended anti-trust action. But Microsoft has lost the near-absolute dominance it enjoyed back then and is in no position to overwhelm cloud rivals such as Google, Amazon and IBM.

Google has led the way in taking cloud computing to the average user with Google Docs, a suite of office applications that can be used via a browser.

Microsoft is reluctant to go too far down that path for fear of undermining its lucrative Office products. Its strategy became evident with the announcement that Windows 7, which is expected to launch in early 2010, is to drop Vista's Calendar, Mail, Photo Gallery, Movie Maker and Contacts applets.

Instead, Microsoft will offer online versions that can be accessed either via a browser using virtually any connected device, or via a set of downloadable client apps on compliant devices.

The point is to combine the

advantages of online and offline work. Online work can be accessed by any computer and is automatically saved, but you need a good connection; the client apps allow you to work on local copies offline and then synchronise files when you go back online.

In the case of office applications, the clients will, in effect, be Microsoft Office 14 – the next version of the company's office suite. Mini versions of Word, Excel, Powerpoint and Onenote will be accessible online through any browser, allowing people to work online on the same document.

Basic online facilities running on those Azure servers will be available free to individual users through Microsoft Live services. Companies will be charged a subscription in addition to the cost of Office 14.

Microsoft Office now faces significant competition offline as well as online, as shown by the rush to download Openoffice.org 3.0, the latest version of the free, broadly Microsoft-compatible office suite. IBM's own version of this, Symphony, has also just been upgraded.

Clive Akass

→ Azure and the server explosion, p16

→ First look at Windows, p17

→ Openoffice.org review, p66

£99 Linux netbook the size of a smartphone

Imovio has launched a £99 netbook only a little larger than many smartphones.

The 9.5x6.5x1.55cm Ikit runs Linux on an ARM-compliant Marvell processor clocking 312MHz, and a 2.6in QVGA display, Wifi, Bluetooth and a Qwerty keyboard, 128MB of Rom, 64MB of Ram, USB and a micro SD slot. Options include a webcam.

The company says the Ikit is intended for casual surfing using either Wifi or via a Bluetooth link to a 3G phone. It comes with a suite of organiser applications and weighs 113g.

The product is expected to be sold in the UK through service providers and phone operators, but there is no word yet on when. www.imovio.com

● For more ultramobile news see pages 10 and 11.



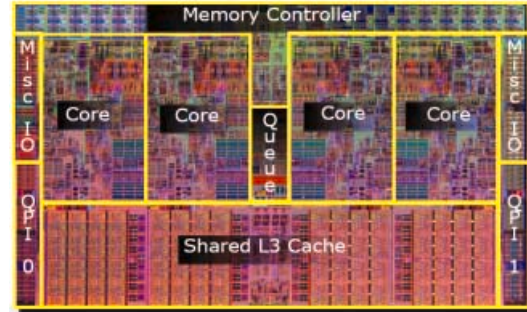
Ikit is intended for casual surfing

Core i7 processors race ahead

PCW's lab tests on Intel's first Core i7 processors, launched this month, show remarkable performance increases over the previous generation. The top-of-the-range Core i7 965 Extreme Edition achieved a PCmark05 CPU score of 11,072 – 7.5 per cent higher than the previous highest non-overclocked score on an Intel QX9770 running at 3.2GHz.

The Cinebench X test, which measures multithreaded performance on multiple cores, showed a 29 per cent difference between the old and new generations: 16,202 compared with 12,544 (see table below).

Some online figures show greater differences, but many of these were tested on an Intel motherboard using the company's X25-M solid-state



Core i7 die, showing onboard memory controller, Quick Path Interconnect (QPI) and 8MB of shared Level 3 cache

disk, which has read speeds of 200Mbps/sec and write speeds of 70Mbps/sec. We used an Asus board to compare the i7 and the Qx9770 on a similar platform.

The Core i7 chips are part of the Nehalem platform, involving what Intel describes as the biggest architecture change in a decade. It includes the new x58 chipset.

A major break with previous generations is that the memory controller is on the central processor instead of on the separate Northbridge chip. This avoids the bottleneck of the connecting front-side bus (FSB), which is superseded by a new fast interconnect called Quickpath.

The arrangement is similar to one that gave AMD the edge over Intel when it launched the Athlon.

Core i7 also introduces the SSE4.4 extension to the instruction set to boost multimedia processing.

The three initial versions of the i7 are the 3.2GHz Core i7-965 EE, the 2.93GHz Core i7-940, and the 2.66GHz Core-i7 920, costing respectively \$999 (£600), \$562, and \$284 in bulk.

AMD plans a quad-core chip, codenamed Shanghai, which, like Nehalem, uses a 45nm manufacturing process.

Core i7 performance, including 965 overclockings, compared with the older QX9770 at 3.2GHz

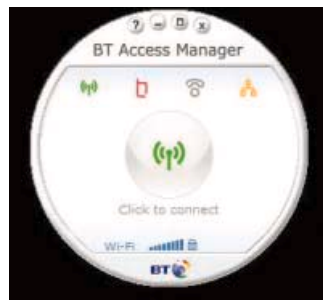
PROCESSOR	i7 965		i7 940		i7 920	QX9770
Clock	3.2GHz	3.8GHz	4GHz	2.93GHz	2.66GHz	3.2GHz
PCMARK05						
CPU test	11,072	12,611	13,051	10,210	9,337	10,311
CINEBENCH X						
Single CPU test	3,698	3,667	4,487	3,621	2,079	3,535
Multi CPU test	16,202	18,331	19,033	14,936	13,317	12,544
3DMARK06						
CPU overall	6,179	7,105	7,322	5,721	5,257	5,181
Red Valley CPU1 Test	2.108	2.426	2.495	1.952	1.774	1.742
Red Valley CPU2 Test	2.898	3.329	3.485	2.683	2.492	2.465

BT mobile broadband offers 'free' access

BT Business is bundling mobile broadband with two of its fixed broadband offerings so users can connect on the move for 'free' for the next two years.

The offer, open to people signing up to BT Business' option 2 and 3 contracts, comes with an E170 USB Datastick 3G modem, and 2,000 minutes of Wifi access at BT Openzone and Fon hotspots,

A 1GB monthly cap is in place, with a 10p per MB charge for any excess. The offer, open to new sign-ups and users renewing deals,



ends on 31 December. After two years there's a £12.50 monthly fee.

Operator 3's business division has introduced 5GB and 15GB

New customers to BT broadband will get 'free' mobile access too

deals at £15 and £30 per month respectively, but these do not come with roaming Wifi access.

O2 recently announced a 10GB package available on a two-year tariff at £30 per month, and a 3GB package for £15 per month. And Virgin Media broadband customers can now get a 1GB deal for £5 per month.

● BT Business Mobile review – see www.pcw.co.uk/2230385.

In brief

Send a mind map

Mindmanager 8.0, latest version of the idea-mapping package, now includes the ability to send mind-maps that can be read by people who do not have the package installed. Another new feature is the ability to arrange search results as mind maps.

→ www.mindjet.com

Cyberlink bundle

DVD Suite 7 is a new bundle of Cyberlink packages for creating, storing and managing content. They include facilities for playing and burning Blu-ray discs on a PC. There are three versions, priced between £59.99 and £79.99. For details see www.cyberlink.com.

USB charger

Varta is selling a USB battery charger, with two AA and two AAA rechargeable batteries for £9.99.

→ www.varta-consumer.co.uk

Scan online

A service called Click2Scan can take the strain out of scanning in old photos. It charges £19.99 for scanning 150 photos to 300dpi JPEGs and returning them on a CD – with the originals; 600dpi scans cost extra.

→ www.click2scan.co.uk

Only \$9bn...

Intel's revenues for the final three months of this year will be \$1bn (£0.6bn) lower than expected at around \$9bn because of falling demand worldwide, chief executive Paul Otellini has warned.

→ www.pcw.co.uk/2230425

LCD scandal

LG, Sharp and Chungwa Picture Tubes have admitted taking part in a conspiracy to fix the price of TFT panels for almost five years up to June 2006, following a US Department of Justice investigation.

→ www.pcw.co.uk/2230386

In brief

Sonos pumps it up

Sonos System Software 2.7, a free download, gives networked Sonos audio players enhanced access to more than 15,000 web radio stations and comes with a new radio guide. The consumer electronics company has also posted a free utility on Apple's App Store to allow its audio systems to be controlled from an iPhone.

Sonos recently launched its smallest audio player yet, the £349 Zoneplayer 120 (ZP120), which, like its £249 Zoneplayer 90 (ZP90), allows users to control existing hi-fi equipment through the Sonos system.

The ZP120 and ZP90 both use version 2.0 of the Sonosnet wireless mesh system, which doubles the range of the previous version.

→ www.sonos.com

DIY supercomputing

Nvidia has been encouraging the use of the massive parallelism of its graphics processing units (GPUs), yoked by SLI technology, to provide supercomputer-level number crunching. This is mostly of interest to specialists but for the first time a consumer application has gone on sale.

Badaboom uses Nvidia GPUs to "dramatically" reduce the time to convert video formats for use by media players. A trial version is also available.

→ www.badaboomit.com

Google iEarth

You can fit the planet in the palm of your hand after Google posted a free iPhone and iPod Touch version of its Google Earth geographical database on the Apple App Store.

→ www.apple.com

\$10.8bn Linux

The most recent version of Fedora Linux code is worth \$10.8bn. That's what the Linux Foundation reckons it would have cost a conventional software company to develop the operating system distribution.

→ www.pcw.co.uk/2228861

Dell Mini is no place for Office

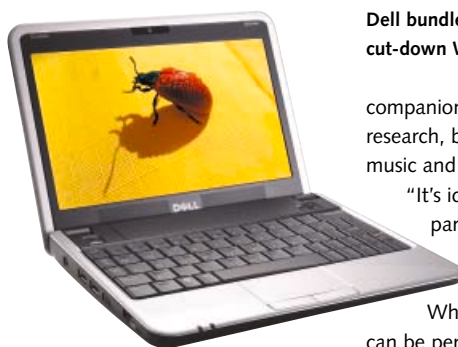
The new mini-portable formats are causing confusion among vendors as well as users. We reported earlier this year how early low-spec models in particular had disappointed some people who had bought them for use as their main computer.

Vendors, perhaps fearful of not meeting user expectations, or of reducing sales of more expensive notebooks, have corralled minis into marketing brackets such as netbooks, as if this in itself will constrain how people use them.

Minis are most effective as portable second machines, complementing a primary system.

But all minis are more powerful than PCs used as main machines until quite recently, and most are well capable of running basic office applications under Linux or XP.

Yet Dell is not offering



Microsoft Office as an option on its new Mini 9 ultra-portables, bundling the lesser Works suite instead. The Mini 9 has a 1.6GHz Atom processor and 1GB of Ram, although its 16GB solid-state-drive puts a bit of a squeeze on software.

A Dell spokeswoman said: "Dell endeavours to offer customers systems configured to provide them with the best user experience. The Inspiron Mini 9 is a portable internet

Dell bundles its Mini 9 with the cut-down Works suite, not Office

companion for email, internet research, browsing, downloading music and instant messaging.

"It's ideal for content usage, particularly with web-based tools, and connecting while on the move.

While some content creation can be performed on the Inspiron Mini 9, it's important to remember that it's not intended to be a primary laptop."

She said Office might be offered as an option in the future if there is demand for it.

There is nothing to stop people buying Office separately and loading it themselves. But Dell's policy could affect sales: one reader who rang PCW concluded it meant the Mini 9 was not up to the job.

Mobile and Mac users lead Openoffice 3.0 rush

Second machines (see above) need second copies of applications, which may be one reason download servers were overwhelmed last month following the launch of Openoffice.org 3.0, the latest version of the free, broadly Microsoft-compatible office suite.

Entry-level editions of Microsoft Office now come with three licences. But the popularity of the new low-cost mobiles means even three licences may not be enough for many people.

Openoffice.org 3.0 users can happily swap straightforward documents with Microsoft Office. Complex formats translate well, but don't expect replicas of more obscure functionality. It also runs native on the Mac OS, and there's a Linux version.

There are caveats. Openoffice.org 3.0 has some rough edges, particularly among its less frequently used functions. You should also remember to save



The suite offers six modules, all of them free

files as .doc if you are sending them to a Word user.

And the

suite is not immune to crashes. While it supports auto-recover rather well, it makes an alarming job of hiding the fact. If lead developer Sun sorts that one out, which shouldn't be hard, then Microsoft has a lot to worry about. In the meantime, if you run Openoffice.org 3.0, save early and save often.

→ [Openoffice.org 3.0 review page 66](#)

Instant-on browser to bypass Windows

Browser developer Opera and Bios specialist Phoenix are teaming up to give mobile PCs near-instant access to the web without booting into Windows.

The fast-loading Opera browser will be optimised for Hyperspace, a Phoenix-developed boot environment that lets software run

independently of the Microsoft operating system.

Phoenix says Hyperspace's minimal use of resources can add up to two hours to battery life.

Opera will allow you to browse the web, read and write emails, and conduct secure transactions – all within seconds of turning on,

according to the two companies.

Phoenix chief executive Woody Hobbs said users will be able to toggle in and out of Hyperspace even when Windows is running.

The Hyperspace environment will support other instant-on applications, including media players and instant messaging.

Rising Asus plans £130 mini



From left: Asus Eee Top, the Bamboo, and the smelly... whoops... fragrant F6V

Asus plans to bring out a version of its Eee PC mini-laptop, costing less than \$200 (around £130), according to company president Jerry Shen.

The latest set of Asus products show the company, which pioneered the low-cost mini, continuing to cut a distinctive path.

A smart touchscreen all-in-one desktop looks inspired by HP's Touchsmart series, but it has a smaller screen and a much lower price. The Eee Top 1602 has a 15.6in widescreen with a mic and a

1.3megapixel camera for video calls, and costs just £449 inc Vat.

It runs XP Home on an Atom N270 processor with 1GB of Ram and what Asus calls Express Gate technology to boot in a claimed eight seconds.

Also unveiled at the Stuff show in London was a rather eccentric design called the Bamboo, which Asus claims expresses the company's "commitment to green principles". There are 11.1in and 12.1in versions, weighing 1.25kg and 1.57kg, respectively, and using

a 2.53GHz Core 2 Duo processor with 4GB of Ram. Prices start at £1,349 inc Vat.

More off the wall is a colourful range of 13.33in notebooks called the F6V, described as "delightfully scented to give users a breath of fresh air while they work and play".

Asus must be doing something right – it has risen to number four notebook vendor in Europe, ahead of Toshiba. Acer is now top vendor of both notebooks and PCs, according to analysts IDC.

Fujitsu splits with Siemens

Fujitsu is severing its joint venture with Siemens, ending a relationship that goes back 85 years. Fujitsu was founded in 1935, but its parent, Fuji Electric, was a 1922 joint venture with the German company. Fujitsu-Siemens was formed in 1999.

The change, which will take full effect next April, means the latest Lifebook range drops the Fujitsu-Siemens brand. It includes the Atom-powered U820, with a screen measuring just 5.6in. The 8.9in P1630 tablet convertible has been upgraded with a 1.2GHz Core 2 Duo.

The N7010 Lifebook, designed to be a desktop replacement, has a 16in display and a 2.26GHz Core 2 Duo P8400. Prices for the P6130 start at about £1,359, the N7010 starts at £935, and the U820 at around £654.

Toshiba claims world's lightest laptop

Toshiba has unveiled what it claims is the world's lightest full-size laptop. The 12.1 Portégé R600 weighs just 800g, yet is powerful enough to run Vista, the company says.

It comes with 3GB of memory as standard and the option of either a 200GB hard drive or 128GB Flash solid-state drive (SSD). Options include a DVD super multidrive and an embedded 3G modem. Prices for the Portégé R600 start at £1,099.

Toshiba launched another ultraportable – the Portégé A600 – as well as the Portégé m750 tablet convertible with a swivel display, the Satellite Pro S300 mainstream laptop, and a new corporate model, the 14in widescreen Tecra R10.

HP also launched two new ultraportables: the 1.1kg Atom-powered Mini 1000, which comes with amd 8GB or 16GB of solid-state disk, a built-in webcam, microphone, Wifi and Bluetooth.

It also includes HP's new Mobile Internet Experience and Mediastyle suite of communications software. HP's new Compaq Mini 700 has the same spec, but comes with 3G connectivity.

The HP Mini 1000 will be available in February at a starting price of about £399, while the Compaq Mini 700 will be available from mid-December at a starting price of about £299.

→ www.toshiba.com; www.hp.com

Sony unveils high-end Vaios

Sony has unveiled a range of high-end Vaio notebooks for travelling executives. The TT range comprises a trio of 11.1 carbon-fibre cased models weighing 1.32kg.

Sony claims the Ultra Low Voltage Core 2 Duo Processor, with dynamic screen lighting, gives up to eight hours of battery life, though it managed only four and a half at the launch event.

A quick-charge feature gives you 50 per cent capacity after being plugged in for an hour. Prices range from £1,349 to £1,999.

→ www.pcw.co.uk/2228732

Apple handhelds 'will boost rival media players'

Apple's iPod Touch and iPhone will increase interest in other portable media players rather than reduce their sales, according to a company that pioneered the format.

"Apple has increased interest in the format," said Tony Limrick, managing director of northern Europe for Archos. He was showing off the company's latest media players – the Archos 5, 5g and 7 –



Archos 5 has more storage space than Apple rivals

all of which offer Wifi access. The 5g supports 3G access on the move, which is available on the other two as a docking station add-on.

The iPod Touch is sleeker and lighter than the Archos models, but they now also offer a slick touch

interface and larger screens with higher resolution.

And crucially for devices intended for watching video and movies on the move, the Archos offerings have more storage – up to 120GB on the smaller model and 320GB on the 7in, compared with a maximum 32GB on the Touch.

Prices of the iPod Touch start at £169 compared with between £279 and £439 for the Archos models.

Kindle delay

Amazon will not launch its Kindle ebook reader in the UK before Christmas because of licensing and roaming issues, managing director Brian McBride told *Bookseller* magazine.

→ www.pcw.co.uk/2228620

In brief

Hub has 3G backup

Chinese telecoms giant Huawei has spun off a new company to focus on products addressing the convergence of fixed and mobile links. The first product from the wholly owned Huawei Communications is the HG553 Voice over IP (VoIP) home gateway, which will be available through Vodafone.

It combines an ADSL2+ wireless router with two phone jacks for VoIP calls, and a dockable USB mobile broadband dongle providing a 3G backup if the fixed service fails.

→ www.pcw.co.uk/2230131

All-in-one 4G

Sandbridge Technologies claims that its latest 4G mobile baseband chip design supports all competing 4G technologies including Long Term Evolution and Wimax, as well as High Speed Packet Access and Wifi. The reprogrammable SB3500 is also frugal enough in its use of power to be used in mobiles, the company says.

→ www.pcw.co.uk/2230221

Flash video

Technology from Recast Digital will allow high-definition and DVD-quality video to be viewed over the web using a standard browser and a plug-in, the company says. Director Jonathan Toni says the Flash-based RDV1 player will allow smaller content providers to rival the BBC's iPlayer service.

→ www.pcw.co.uk/2229749

Spacy network

Major US companies, including Microsoft and Google, have backed a report saying a free wireless network could be set up using so-called white spaces – unused frequencies between broadcast channels.

The frequencies were left free to avoid interference between channels but the Federal Communications Commission report concluded that this will not be an issue.

→ www.pcw.co.uk/2228570

Intel pullout threatens UWB

The future of Ultrawideband (UWB) links looks in doubt following the collapse Wiquest Technology, which pioneered the technology. And Intel has ended a five-year research project into UWB, according to an *EE Times* report.

UWB products have yet to hit the market due to performance and regulatory problems. Wireless USB (WUSB) products, which replace the usual cable with a UWB link, are due to appear in Europe early next year but will take the form of adapters that plug into USB sockets rather than being driven from host devices. This means data has to go through two extra media transitions and the link carries the overhead of both wired and wireless protocols.

As a result, data rates are hardly better than Wifi. A €59 (£48)

WUSB adapter kit announced by Italian firm Olidata has a throughput of between 30Mbits/sec and 70Mbits/sec depending on the application, the company says.

Native WUSB systems, in which data goes straight to wireless, could hit speeds of up to 480Mbits/sec, the rated speed of wired USB, and UWB itself could be pushed to 6Gbits/sec, according to proponents.

TV vendors at the IFA consumer electronics show in Berlin were using a 60GHz wireless link to shunt high-definition video across rooms – a task predicted for UWB. Also in the running for the job is a 5GHz system Wireless Home Digital Interface from a company called Amimon.

Stephen Wood, president of the

Wimedia Alliance, said in a statement that Wiquest had been a victim of the current economic climate and he was confident that UWB would continue to build momentum, with new chipsets easing regulatory issues. He pointed out that Bluetooth was written off in its early days.

Eric Brookman, chief executive of Wiquest rival Alereon, points out that UWB offers fast data transfers at infinitesimal transmit power levels – offering an efficiency, in terms of watts per megabyte, of between five and 10 times that of Wifi.

Toshiba is using Alereon silicon in a wireless UWB version of its Dynadock universal docking station, which is due to be released early next year.

Clive Akass

Bluetooth swings to Wifi for fast pipe

Doubts over ultrawideband (UWB) are affecting the development of next-generation Bluetooth links, which were originally going to use the technology as a fast data pipe.

The idea was to use Bluetooth's power-efficient signalling to set up transfers between devices that would then use UWB to pump the data. But the governing Bluetooth Special Interest Group (SIG) decided earlier this year to look at using a fast Wifi pipe as an option for the next-generation Bluetooth 3.0 spec.

Handset manufacturers at a Bluetooth Evolution Conference in London were veering in favour of Wifi. They pointed out that it has a huge installed base already, and that combined Wifi and Bluetooth chips are already available.

John Barr, director of standard realisation at Motorola and chairman of the Bluetooth SIG, said he had been a founding member of UWB's Wimedia Alliance but he had to admit that UWB vendors had yet to deliver on promises.

Patric Lind, local connectivity specialist at Sony Ericsson, said his company would use Wifi in the short term because it is already available. But he stressed: "We are not ruling out UWB."

Robin Haydon, standards architect at Cambridge Silicon Radio, argued that offering two alternative data pipes is good. CSR is also developing ultra-low-power Bluetooth using batteries that could last for years. Possible uses include heart monitors that link to watches.

HP phones sport new slideover navigation button

HP unveiled the iPaq smartphone, seen by many as its answer to Apple's touch-driven iPhone. But though the iPaq Data Messenger (DM) has a touchscreen, it is more like the Android-based G1 in that it has a slide-out hard keyboard.

Its most novel feature is an optical button you slide your finger over to navigate the screen and press to select. This also features on a companion model – the iPaq Voice Messenger (VM).

Neil Dagger, business manager



of HP's wireless personal systems group, said the devices were designed to appeal to both the consumer and business markets.

The DM keyboard has surprisingly large keys and, on a cursory test, seemed rather better than those on the G1.

The VM shrinks a Qwerty layout two letters to a key on to a five-by-four number pad. Unlike the keypad on Sony Ericsson's M600i and M610i, the VM uses both predictive text and multi-clicking.

Both are available on contract through Vodafone, or from HP at £333 for the VM and £399 for the DM – both prices inc Vat.



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Media hubs eat into WHS pie

Western Digital is the latest storage specialist to push a media hub product designed to link computers or peripherals with consumer electronics devices.

Its £79.99 HD Media Player reads multimedia files directly from any USB drive and plays them to a TV via an HDMI link. All major audio, still and video formats up to 1080p HD are supported.

Omega's Screenplay Pro HD does something similar but has its own network drive, and it will record content directly from a set-top box. A USB port allows it to be connected to extra storage, and

it supports component and composite video output.

It comes in 500GB and 1TB capacities at £159.99 and £199.99 respectively.

Omega was bought by storage specialist EMC in June, enabling it to bundle what it says is enterprise-class Retrospect Express backup software with new products including its entry-level £69.99 500GB Prestige USB drive. It also comes with 2GB of free backup storage with the Mozy online service.

Buffalo has launched a network-attached storage (Nas)



Some microSD players will be styled for particular performers

box, the Linkstation Quad, with media-server functionality and capacities of between 1TB and 4TB, with prices ranging from £400 to £840 inc Vat.

Home-media hub vendors using Windows Home Server would find it hard to compete with some of these products on price, which may be why Microsoft has dropped the US price of the software by 30 per cent to around \$100 (£65).

● Dream box for pirates – see Barry Fox on page 22.

Hauppauge buys Pinnacle PCTV

Avid Technology is selling its Pinnacle PCTV line to rival Hauppauge Technology, though it will retain Pinnacle video and audio software products, such as its Studio and Dazzle lines. The Showcenter range, which streams home digital content via a Pinnacle box to a TV, will also remain with Pinnacle, as will Soundbridge, PCTV Togo and Pinnacle Video Transfer. Hauppauge will take over customer support and after-sales services for PCTV products.

Sandisk sings praises of microSD music

Memory specialist Sandisk is hoping a new range of preloaded microSD cards will supersede the CD as the dominant offline music publishing system.

The 1GB 'Slotmusic' cards play in any device with a microSD slot. Each card also comes with a mini adapter allowing them to be read by any device with a USB port, including some car stereos.

Tracks are stored in 320Kbits/sec MP3 format and can be backed up and played on other devices.

To encourage their use Sandisk has also launched a low-cost music player called the Sansa, costing \$35 in the US complete with a \$15 Slotmusic card. UK prices have yet to be finalised, presumably because currencies are likely to fluctuate between now and European launch early next year.

Tracks by dozens of artists from EMI, Sony BMG, Universal and Warner have already been lined up for Slotmusic cards.

→ www.sandisk.com



Music labels are lining up tracks for release on microSD cards

Golden slot

Good to know the recession has yet to bite everywhere. California memory specialist Super Talent is selling a limited edition of an 8GB 18-carat gold USB memory drive etched with your chosen text or graphics at a dealer price of \$599 (£400). The one concession to the economic uncertainty on the company blurb is a warning that the price may fluctuate.

→ www.supertalent.com



Panasonic shrinks fuel-cell battery to fit laptops

Panasonic is preparing to unveil a slimmed-down version of a 20-hour methanol fuel-cell battery it displayed at the CES show in 2006.

The new prototype comes in a 270cc version for notebooks and a

360cc standalone product. Both offer 20 hours of power at 10W. The company has reportedly set 2012 as the target release date.

Methanol cell batteries have been in development for several

years as a possible replacement for lithium-ion units. Direct methanol fuel cell systems are said to be cheaper and less volatile than hydrogen fuel cells.

→ www.pcw.co.uk/2228652

Battery recall

More than 100,000 Sony-made batteries in HP, Dell, Acer, Lenovo and Toshiba notebooks have been recalled following 40 cases of overheating – 21 of which caused minor fire damage.

→ www.pcw.co.uk/2229542

Back to the future

Cloud computing, which recalls the ways of the old mainframe, is catching on with an explosion of servers and a new operating system from Microsoft. Clive Akass reports

In the old days, when computing was young, processing was done more or less at a distance using shared time on mainframes. Desktop computers never quite saw all that off, and something very like it has been making a comeback under the flag of a new buzzword: cloud computing.

It uses massive server farms instead of mainframes and its users (even its computers) may be spread worldwide; but essentially it is the same old resource-sharing system, and even after you scrape off the hype it has clearly hit the big time.

Fast data communications has enabled the change but driving it has been the demand for processing and the cost of providing it. Many companies are running out of physical space to put servers, and the cost of powering and (as expensive) cooling them can be astronomical.

For years servers were used inefficiently, often dedicated to a single task for fear that a problem with one application might bring down another. As a result many servers were under-used.

The advent of virtualisation allowed one machine to act as several distinct virtual machines, and by extension a group of servers could act as a far bigger group (or cloud) of virtual machines. You can hope to throw a task at the group and not need to care which machine it is run on.

This setup is particularly suited to selling processing as a utility, like electricity. Amazon started doing this back in 2006 with its Amazon Web Services and web giants are building up capacity to meet an anticipated demand.

Google is reckoned to be running no fewer than two million servers, and stacking on more by the day; Microsoft, depending on which figure you credit, is buying between 10,000 and 35,000 servers a month. This processing for hire is very useful for companies that need massive processing power for short peak periods.



Microsoft chief software architect Ray Ozzie outlines the company's cloud strategy at its professional developers conference

Companies of all sizes can use it to try out new projects without having to invest in infrastructure. And it allows the proverbial one man and his dog to build and rapidly expand a web service such as Facebook from virtually nothing, drawing on the computing equivalent of a National Grid.

But how? This is where Azure, Microsoft's cloud operating system, comes in. "It's cloud computing for the masses," said Don Scarfe, chief executive of Britain's Dot Net Solutions, which has written a Wikipedia analysis application demonstrating Azure.

He says people familiar with the C# language and Microsoft's .Net Framework should be able to write an Azure application with no special training – and there are a lot of those skills about. "Something like 50 per cent of projects in the world are now developed around

the .Net framework," Scarfe said. His business is built around .Net, so he is bound to be enthusiastic, but he is surely right in saying this gives Microsoft an advantage over the likes of Amazon and Google. Yet companies are reluctant to rely on a single supplier – and Azure locks them into Microsoft not just for supplying the software but also for running it, and holding their data.

This is because Azure, which is due to launch within a year, will initially run only in Microsoft data centres. Scarfe said Microsoft executives have told him that this was to enable them to ensure a robust system, and that Azure may be available for use in third-party centres in future.

Mobile computers, from the iPhone to mini-notebooks, can save power by offloading to the cloud heavy processing such as speech

recognition. And it can allow users to access the same personal computing space from anywhere on any device – if they are using a platform-independent system.

The competition for serving their needs is epitomised by the Google Docs online office suite and Microsoft's evolving Office Live services. Microsoft is fighting on two flanks here because it has to compete with Google online while protecting its traditional software sales; judging from its recent announcements (see page 8) it is playing that with some cunning.

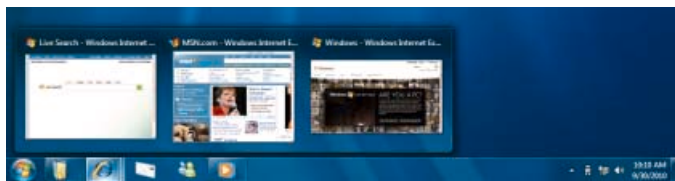
Google Docs can be used from within any browser, which means it is theoretically platform independent. Scarfe points out that browsers vary a lot in their functionality and he claims Google Docs designers spend half their time fighting the limitations of browsers. "HTML [markup language] was never designed for what designers want to do. It was designed for flat text," he said.

Azure will be able to throw up pages using Silverlight, a Microsoft plug-in with impressive rich formatting, interactive and multimedia features. It is said to be compatible with leading Windows and Mac OSX browsers, and Microsoft says Windows Mobile 6 and Symbian phones will be supported. An open-source version for Linux is also in development.

Silverlight is not being ported to Apple's iPhone and iPod touch, though they are to get a player for Adobe's rival, more popular, Flash technology. Adobe is also facilitating its use on other ARM-based devices, which are getting more powerful. As we went to press, Qualcomm launched a dual-core 1.5GHz ARM-based Snapdragon chip said to be capable of running a netbook-class device on one charge for a day.

The goalposts are shifting and developers don't need Microsoft to put on a show. Azure will surely succeed, but it will not sweep all before it.

Early debut for Windows 7



Left: Revamped system tray/taskbar

Centre: Paint/Wordpad get ribbons; Calculator gets more functions

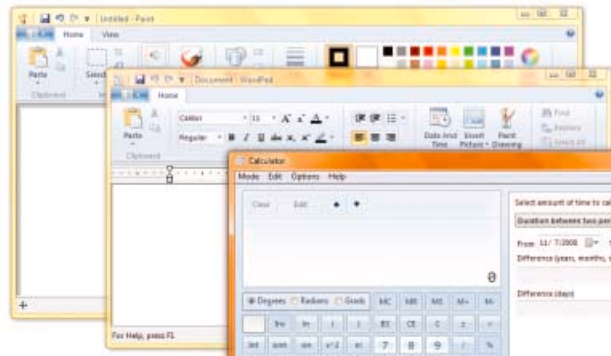
Bottom: Access tasks with jump list

Microsoft has shown an early version of Windows 7 – the follow-up to Vista – at conferences in Los Angeles aimed at developers and hardware engineers. Under the hood the new Windows reports itself as version 6.1 (Vista is 6.0), which is a clue to the extent of the changes. The core architecture is the same, and Microsoft claims everything that runs on Vista will also run on Windows 7.

There are nevertheless numerous new features. The most obvious is the revamped taskbar, which has larger icons, full-screen preview and a new quick menu for each application called a jump list, which gives immediate access to commonly used features. The Sidebar has gone and gadgets now appear on the desktop.

Multitouch support, similar to that seen in Apple's iPhone or Microsoft's table-top Surface computer, lets you drive suitable Windows PCs with your fingers, moving objects with gestures.

A new sensor programming interface (API) offers standardised support for devices that report location, movement, sound, light and other inputs, paving the way for PCs that respond to their environment. Microsoft has also created a Device Stage window, which allows makers of phones, cameras and other devices to



create custom screens that appear automatically on connection.

Home networking has been streamlined, media sharing is easier, and Windows is smarter about supporting both work and home networks on a single laptop.

The applets supplied with Windows are refreshed, with Wordpad and Paint getting Office-2007 style ribbons, and Calculator

acquiring numerous new statistical and scientific features.

Microsoft also seems determined to make Windows 7 quieter. User Account Control, the security feature in Vista criticised for being too chatty, has been tamed so that prompts rarely appear and users can tune it more easily.

Microsoft has also worked on the system tray, which often gets crowded with applets competing for attention. In Windows 7 users can customise this with a single click and suppress unwanted messages.

The new Windows is meant to deliver better performance on the same hardware and, judging by the current pre-beta given to the press on loan laptops, that actually seems plausible. Users are likely to enjoy this release, even though it is low-key in terms of features. The date is not yet announced, but it is rumoured to be no later than 2010, or winter 2009. *Tim Anderson*

Microsoft makes a fine mesh of things

Among the online services that Microsoft is developing alongside Windows 7 is one called Live Mesh, which lets you set up an online storage space for sharing by several computers – also known as a mesh ring.

Changes to any of the online documents are mirrored on the

meshed computers whenever they go online. You can set up folders just like on your own PC, and you get 5GB of storage free.

Online storage site Humyo already offers something similar, but Microsoft plans to take the idea further. Any meshed computer will have remote desktop access to

any other one in the same ring. You can also invite guests to share folders on the mesh and collaborate on projects.

Live Mesh product manager Ian Moulster says it is also possible to build applications on the Mesh platform. You can try a beta of the service at www.mesh.com.

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★
LETTER OF THE MONTH

Software installation still stuck in the 1990s

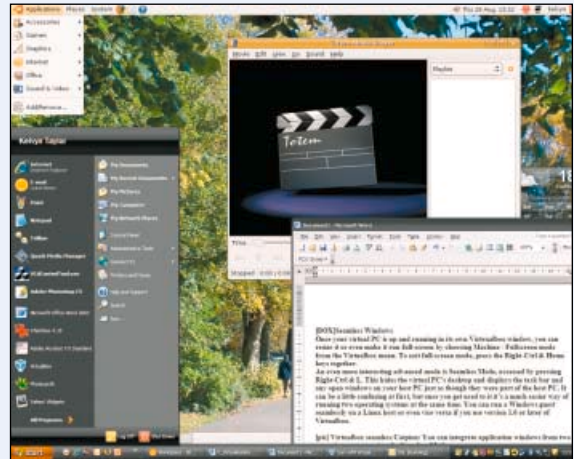
Once upon a time, installing a new program meant going to a shop, paying for a nice shrink-wrapped box, taking it home, and then firing up E:\SETUP.EXE or whatever. You might have had to uninstall the odd program, but that was rare.

Nowadays, though, you can find a website that is full of links to the most awesome software – most of it completely free – and decide that you need to install it. Inevitably, only some of those programs turn out to be as good as you'd hoped, but most of the others leave traces on your system after you get rid of them.

Eventually it gets to the point where I wipe the C: drive and restore it from an Acronis backup image.

After that, though, you have to set up the good stuff all over again. Even if you make a backup every time you install something new, what if you later decide that something already there is now *programa non grata*?

The problem is that software makers haven't yet realised that, for most of us, frequent installations and frequent uninstallations are a fact of life rather than a big occasion.



Although not a perfect solution, a tool like Virtualbox does allow you to try software without messing up your Windows installation

So does anybody know of a nice way of managing the installation and setting up of programs? Or do I just need to rein in my software habit?

Lawrence Drever

Nigel Whitfield replies: Unfortunately, even Windows 7 still perpetuates the horrors of the Registry, so installation-related problems are likely to remain with us for some time. In the meantime, one of the only ways to avoid some pain is to use a virtual machine to try out software before adding it to your main installation.

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REVOLUTIONARY HERO

Thank you for your Linux article (PCW Christmas 2008), which gave me the courage to try it out again. After two days, I'm finding it very easy to use and for most problems, the web has proved a great guide. I tried Linux once before – years ago – and ran into major problems immediately. I never gave it a second chance.

Back then, my problem was my network connection: Linux never detected my NIC (network interface card) and left it without the driver. But this time around,

it detected and installed the relevant driver and as soon as I got the OS running it downloaded updates. It even asked me if I wanted to install a compatible driver for my graphics card.

I hope this inspires others to give Linux another try.

Adam Joseph

ANY OS YOU LIKE SO LONG AS IT'S WINDOWS

I am looking to buy a new laptop and want to join the Linux revolution. I looked at suppliers of laptops, and there is a plethora of

makes and models. We are so spoiled for choice, but which one to choose? The answer is: none.

The big sticking point is the operating system. I want a laptop with Linux and without Vista or XP. However, if you want a Linux machine you have to pay money to Microsoft and buy a laptop with Vista (or XP at a push) and then install Linux yourself. No wonder Microsoft can claim to have sold millions of licences, because there is no option.

I asked Dell why it didn't offer Linux on all its machines, to

which the company responded that the demand was for Vista. Well of course the demand is for Vista, because Vista is all you can buy, apart from a few options on desktops.

It seems you can have any operating system you like on a laptop, providing it is Microsoft. The only exception as far as I can see is with netbooks.

I have just purchased an Acer Aspire with Linux, but the sales assistant still recommended spending an extra £60 to buy the XP version.

Graham Stewart

Kelvyn Taylor replies: There are a couple of firms that will supply laptops without an operating system, such as PC Specialist and OCZ, but there is apparently not a massive demand for Linux laptops. It's a problem that's been around for years, but perhaps the popularity of netbooks will rekindle interest in Linux.

SMARTPHONE, NOT SO SMART USER?

Are smartphones becoming too clever or over-complicated, or are users not smart enough to work out how to use them? In his letter to PCW last month, Andy Low said: "None have the basic essentials I require."

Has he actually switched on his phone and used it? Windows smartphones have all the functions that Andy is looking for, and a simple search could find many more downloadable applications suitable for his needs and device.

Pin-locking your smartphone can be enabled under Settings > Lock. You can also download third-party apps such as Slide2unlock.

Johnny Wan

Nigel Whitfield replies: Perhaps a large part of the problem is that, for all their advanced technology, many smartphones aren't that intuitive to use. Windows Mobile all too often shows its roots as a stylus-driven system for PDAs, for example, even with a slick interface slapped on top. While phones have become more like computers, many users still aren't as used to the idea of installing software on their phone as they are on their PC.



Smartphones may look slick, but are they really built on an easy-to-use foundation?

A TUNEFUL SCAM

This morning I had a call from someone investigating suspicious transactions on my credit card. It transpired that there was only one suspicious transaction – for 65p on iTunes.

The card security person said that scammers sometimes use iTunes to test potential card numbers, possibly randomly, to see if they are valid.

I knew it was a fraud right away because I have never purchased anything from iTunes, but what if I had?

I could easily have been caught off-balance and said, "yeah, it's OK", and then lost a fortune because I would have over-ridden the security check from the card company, all thanks to Apple's poor security.

My credit card company's approach seemed over the top at first, but kudos and thanks to the staff there for their vigilance.

Raymond Barclay

Nigel Whitfield replies: We don't think this is actually anything to do with Apple. To buy from the store, you need a full set of card details in the first place, including the security code on the reverse. So the iTunes store would seem to be no more and no less secure than any other outlet that allows you to buy items for a small amount.

If someone has all the details of your card, then there's nothing a website can do to stop them from using it. That's why credit card companies call and verify transactions that seem out of place. Protecting your personal details is crucial, because if someone else has your

details, no website can possibly tell the difference between you and a crook who is using your card.

SAVE THAT UPGRADE UNTIL LATER

I was glad to see Steve Firth's opinions in PCW (Letters December 2008), since I too despair of the constant exhortations to upgrade, whether it be hardware or software. Unfortunately, one cannot nowadays have the latter without the former even though one reason for retaining some hardware items that are virtually museum pieces is the ability to run Dos programs. This brings me to another problem.

Running Windows XP, it is easy to download and save the latest security packs from Microsoft as they come along. But I still have Windows 98SE on one of my PCs and would dearly like to obtain the OS upgrades until support ended a few years ago. Sadly, such upgrades do not seem to have the option to save, only to download and install. Does

CLARIFICATIONS

- In our review of Roxio Creator 9 (PCW, Christmas 2008) we incorrectly stated that Videowave cannot do chromakey effects.
- In the PC Essentials section of the same issue, we printed an incorrect photograph to accompany the Chooix Easy Fit Eee PC Sleeve.

anyone know if Windows 98SE upgrades are archived anywhere?
Bill Wallace

VISTA'S TRUE COLORS

Gee, I don't know what I'm more cross about: the fact that Vista Windows Mail does not have a UK English dictionary for its spell checker or that it's taken me a year to realise! Spelling used to be a specialty of mine but I suppose I've gotten used to American.

Ian Smart



WIN

Next month's prize for the letter of the month is a Logitech Audiohub



The Audiohub provides premium audio in a compact notebook station. The space-saving design combines a powered three-port USB2 hub with a 15W speaker system featuring high excursion drivers and an innovative three-chamber design with integrated subwoofer.

With a telescopic body and webcam stand, it can be adjusted to suit most laptops and monitors, and the USB-audio support can give a welcome boost to the sound capabilities of many portables.

For more information on the Audiohub and other Logitech products visit www.logitech.com.

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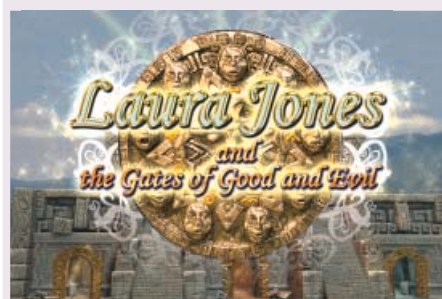


Clear all the bricks by directing the ball in the right direction using your paddle. Some bricks will give you one of 45 outrageous bonuses, of which some will help you clear one of 200 levels in no time, while others should be avoided at all costs. You will not be able to stop playing this visually stunning game.



Free Download

Laura Jones



Solve the adventure puzzles, get all the Keys to the Gates of Good and Evil, play lots of mini-games, find out the secret of the Gates, and save the world from fatal destruction.



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You only have 80 days to circumnavigate the globe. Think that sounds easy? Travel back in time to the late 19th century and get ready for spectacular adventures on land, sea and air together in this outstanding puzzle inspired by the classic adventure novel.



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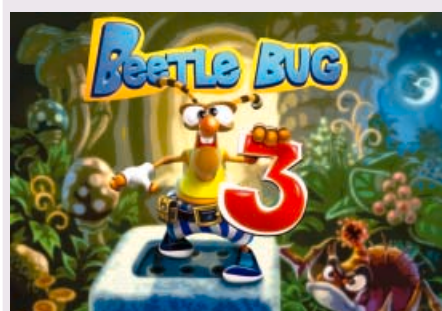


It is time to jump in your rubber boots – get your own business started with an up-and-coming farm in Green Valley! Now it is your turn to harvest fruits and vegetables, shear the fluffy sheep, let the little fledglings hatch, and build up a cozy house in the countryside.



Free Download

Beetle Bug



Beetle Bug is back and he's going deeper underground to his little buggies, which got kidnapped. Help him to rescue his offspring and lead them back to safety. A great storyline and mouse controls make this adventure game a must have.



Free Download

www.pcw.co.uk/games

Gordon Laing



hardware@pcw.co.uk

Sauce for the goose?

Two Laing systems failed – one because it was updated and the other because it wasn't. Sometimes it's best to leave well alone

It's always frustrating when one PC stops working, but two recently failed in the Laing family in the same week. A relative's laptop refused to proceed to the Windows desktop, and a few days later my own Media PC hung during startup. No vital information was lost in either case, but both required complete reinstallations of Windows and involved significant downtime. Online updating was involved in the explanation of both failures, but for completely different reasons.

The laptop was the victim of no fewer than 67 viruses. While unable to personally attend its bedside, I understand viruses were a mounting problem that had finally tipped the device over the edge. The viruses were relatively well known, though, and could have been caught by a vigilant anti-virus system with regular updates.

'A reinstallation was required under the disapproving glare of the Laing household'

But the Media PC appeared to be the victim of updates, specifically Windows XP Service Pack 3. SP3 had begun installing itself while I was shutting down the PC one evening and, rather than wait for what looked like a lengthy process to complete, I went to bed. The next morning I awoke to the blue screen of death.

Regular readers will know I'm a firm believer in treating a Media PC more like an ordinary consumer electronics product than a computer. Once it's working fine, leave it alone: don't tweak, don't install any software, avoid anything that might change the situation. The moment you begin tweaking settings or installing programs, you risk it not working.

Whether you're a TV addict, or someone who lives with one, there are few things worse than settling down for an evening's entertainment that never arrives. It's where the dream of PC-as-entertainment-system collapses, as the blue screen of death is unlikely to be resolved by a simple restart.

You're probably looking at serious diagnostics and subsequent repairs, which will almost certainly mean no telly for at least an evening.

That's no bad thing if it means a night of compelling debate or family games instead. But most likely the person who thought the Media PC was a great idea will be spending their leisure time fixing it.

Most updates are designed to address the problems facing ordinary PCs, which constantly download files, open attachments, exchange data and access potentially hazardous links. A dedicated Media PC may not be anywhere near as vulnerable. It may never exchange emails or browse the web. The files it opens are generally trusted ones generated by itself or the owner. Most Media PCs dedicated solely to entertainment are at relatively low risk.

My Media systems have never been the victims of viruses or other security problems. The only downtime they've had is when curiosity or perceived wisdom saw me tweaking some aspect that subsequently failed.

The frustrating thing was that I didn't even want SP3. A recent build was working fine without it, but before I remembered to disable Windows Update, the file had downloaded and was now badgering me to install it. Every night I closed the reminder until one tired evening I slipped and activated the installer.

I'm not sure how or why it didn't work on this particular PC, but the result was a system that failed to start up and demanded a reinstallation of Windows under the disapproving glare of the Laing household.

There are two morals here. The first is that regular updates are highly recommended for the smooth running of most PCs; if configured properly, my relative's laptop would probably have survived its barrage of viruses.

The second moral is what works for one PC may not be appropriate for another. I now switch off updates on a dedicated Media PC. The minimal risk from viruses and other nasties is outweighed by potential downtime caused by tweaking.

This may be a step too far for the more cautious, but my advice to anyone who has a perfectly operational Media PC is to resist the temptation to install or tweak anything and just leave it alone. As the saying goes: if it ain't broke, don't fix it. **PCW**

Barry Fox



barryf@pcw.co.uk

Piracy on the high def

Hollywood is foolishly ignoring a new dream tool for box-office pirates to rip high-definition Blu-ray and pay TV content

A month is a long time in consumer electronics. Last month I got wind of a new high-definition personal video recorder (HD-PVR) to be launched by Hauppauge. From advance demonstrations, there seemed no reason it should not become a dream tool for pirates, ripping Blu-ray discs or premium satellite pay TV programmes in HD.

I borrowed one to try out and ran some tests. What I found was an analogue-to-digital converter box that connects to an HD player or receiver by a component-video lead, and to a PC by USB. Processing power in the PVR box converts the analogue HDTV signal on the fly to H.264 digital video, and analogue or digital audio to AAC. After capture to hard disk, the H.264/AAC recording can be converted by Arcsoft Total Media Extreme software to a variety of

It is illegal to rip or sell Blu-rays or pay TV movies, but DVD pirates in pubs and on the streets already flout the law. They can rip region-free versions of American Blu-rays or pay TV shows.

Although the latest Sky HD receivers have only HDMI outputs, all previous Sky HD boxes had component connections. For pirates they will become the items of choice. In the US, DirecTV's HD receivers and HD-PVRs have component-out as well as HDMI. Even if Blu-ray players such as the PS3 eventually go HDMI-only, millions of existing models have component sockets.

Because I abhor commercial piracy, and have never seen a flicker of interest (and certainly no gratitude) from the studios when I have tried to warn of new piracy risks, I ran a test. I wrote about the new risk of Blu-ray and pay TV ripping in the trade press, deliberately omitting the name of the PVR, but giving my email address for bona fide requests for more information.

Only one person with any direct connection with a studio contacted me. There was zero response from Hollywood's many trade bodies.

But a dealer, whose livelihood depends on selling and renting DVDs and Blu-rays, did get in touch. He wrote: "New films are available to download in HD from Xbox Live Marketplace for just a few quid. These films stay on the Xbox console for 48 hours before the console automatically deletes them. Surely this device would be able to copy the film in HD? The disc could then easily be duplicated and handed freely around. Also, I presume these copies could then be uploaded on file-sharing networks."

A few days later, he added: "My fears about being able to download AVCHD files off the internet for playback on Blu-ray players were correct. They are already available. I downloaded a small HD sports file off a forum which had been captured using this Hauppauge device."

For around £150 the pirates now have a simple way to rip Blu-rays, HD downloads and pay TV programmes in HD to low-cost DVDs, or share them over the internet. Higher broadband speeds will make sharing easier. Blu-ray burners will improve rip disc quality.

Once again, the genie is out of the bottle before the studios realised it was hiding there. **PCW**

'For £150, the pirates now have a simple way to rip Blu-rays in HD to low-cost DVDs'

formats, including AVCHD, which is the HD camcorder format supported by many Blu-ray players, such as the one on Sony's PS3 console.

The AVCHD can be burned to blank DVD. Capture rates are between 1 and 13.5Mbps/sec; at 5Mbps/sec around two hours of 1080i AVCHD will fit on a blank single-layer 4.7GB DVD. This will then play on a consumer Blu-ray player.

At 5Mbps/sec the picture is softer than Blu-ray, with some artefacts on fast motion, but higher rates give better quality and shorter playing time. Using dual-layer 8.5GB DVDs or Blu-ray blanks increases the playing time.

Is it legal? The Hauppauge box is not defeating any digital rights management and there is no Macrovision copy-protection on component connections, so no defeating is needed. Hauppauge is marketing its box as a TV recorder, and TV recording is now a way of life. The Hollywood studios have already turned a blind eye to widely available devices such as the Pinnacle Transfer that rip the analogue output of a DVD or Blu-ray player, or satellite receiver, to MPEG-4 for portable play on an iPod, Archos or PSP.

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You are the weakest link

Moaning about irritating security measures making your life more difficult only boosts the rising levels of IT-related fraud

I've known for a couple of years that 'script kiddies' aren't the problem any more. When your computer gets a virus, it's gangs – gangs of organised criminals – who have turned your machine into a demon. What I didn't realise, though, was just how much more they're doing these days.

I had to do a special supplement on fraud for a national newspaper and interviewed some of the country's most senior fraud experts. What those experts told me was that three years ago, when the gangs first started masterminding zombie networks, they were mostly involved in extortion. They would hijack a couple of thousand PCs around the globe and use them to flood a victim's website with viruses and bring it down. The bosses would then ring up the victim and tell them where to send the ransom. Typical early

some estimates, for 60-80 per cent of all fraud. But card fraud, online fraud, bank phishing scams and Nigerian 419 cons are catching up – and fast.

Two interviews stood out from my research. Former Fraud Squad boss Tim Harvey said the police couldn't be expected to cope. He gave the example of a suspect held in a Swiss jail: "The police can't just ask questions, but have to send a team and state, in advance, exactly what questions they will put to the suspect. Of course, most of the important questions arise from the answers, so they have to go back home, and work out what questions they now need to ask and reapply for permission to interview, and include all the new questions."

Frauds on Ebay and other auction sites are not ignored by the police, but there's a limit to how many can be investigated; and of those, an even smaller number can be prosecuted. If you've been done for a couple of hundred pounds, you can forget about the police taking an interest: you're one of hundreds each week, and there are fewer than 500 fraud policemen in the UK.

The other highlight was a chat with Alex Conran, one of the three comen presenters of *The Real Hustle* show on the BBC.

The problem, he says, isn't the computers, nor Ebay, nor the police being short-handed. The problem is us: you and me. "We want things to be easier and simpler. If our bank holds us up for five minutes while it checks out a possible problem with our credit card, we get angry and threaten to move our business. But you can't be quick and simple, and also secure."

I looked hard at the issue of data analytics. Data mining, as it used to be called, can expose frauds and even predict them. So there is some hope that the very machines that make internet fraud possible may come to offer a real defence against a threat that could close down the online world.

But as long as users complain about the irritations of fraud prevention measures, banking and online sites will try to keep them happy, accepting losses in the hope of getting bigger sales. This just feeds the fraud gangs.

A computer is no more secure than the person sitting in front of it. And that's you. **PCW**

'The problem isn't the computers, nor Ebay, nor the police being short-handed'

victims were betting and gambling sites. "We just brought your site down for eight hours; tomorrow is the Grand National. How much do you normally take in bets on the Grand National? We want 10 per cent of that; here's the Swiss bank account you have to transfer it to."

That's what I was expecting to write. But what I found was that the gangs have moved into fraud, and that their operations are going up year on year.

It turns out to be really hard to measure the size of the fraud industry. Obviously, the bigger fraud gangs aren't public companies and don't post quarterly reports. Private companies are secretive enough about their turnover figures, but they're braggarts compared with Eastern European or Asian fraud gangs; so-called official fraud figures from organisations such as KPMG Forensic are, as they'll freely admit, just a fraction of the whole.

Fraud is not all about computers, by any means. The most likely perpetrator of the next fraud to strike the company you work for is the quiet, unassuming, dedicated and loyal worker in the next cubicle. Employees account, according to

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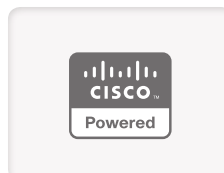
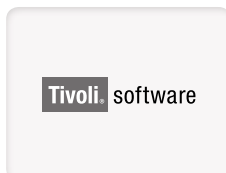
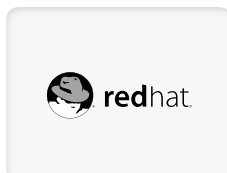
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Navigating the network maze

It's all too easy to be left dazed and confused by the networking maze, admits Alan Stevens, but this special guide will help you gain your bearings – and the upper hand

Once something only of interest to geeks and corporate IT staff, networking is fast becoming something we all need to do, whether we like it or not. Primarily, that's because most of us have more than one PC and want to share internet access, files and printers. But, increasingly, it is also about supporting more advanced activities such as streaming music and movies around the house or checking email and

being able to access important files when away from home.

Home networks are, as a result, becoming commonplace, but that doesn't make them any easier to put together or manage. Despite extensive coverage of networking topics in *PCW*, both in features and our regular Hands On Networks column (see page 148), we can't all be experts and it can still be an uphill struggle working your way through what remains a complex subject, with all kinds of pitfalls ready and waiting to trap the unwary.

Even if you're an old hand it's surprising how quickly you forget the basics, so the idea behind this guide is to look at what's involved in building a home network. It's a way of introducing less experienced readers to the concepts, technologies and product options involved, but also a refresher for the expert user looking to expand or enhance their setup.

First a word of warning. It's almost impossible to discuss networking without using some horrendous jargon, although

Hidden assets

Switches are cheap but you don't necessarily have to buy one to build a cabled network. Take a look at the router provided as part of your broadband package, as often you'll find it's a combined router/switch with four or five network ports on the back. Any PC, laptop or server attached to these ports via a standard network cable will be able to communicate with any other and share files and printers. And you don't need any extra software: it's all in your operating system.

Don't buy a network switch until you've checked to see if your router has one built in



we've tried to keep this to a minimum. For total newcomers to the topic, we'd suggest first taking some time to read the free *Ultimate Guide to Home Networking* ebook published by our sister title, *Computeractive*, included on this month's cover disc. In this you'll find clear explanations of many of the basic networking terms and concepts.

The hardware

To build any kind of network you're going to need hardware. Time was when that inevitably meant a network switch (a device that connects all the different parts of a network together and ensures data goes to the correct destinations) to which everything had to be cabled, but no longer. A number of more popular alternatives are now available, such as Wifi wireless networking and Homeplug (sometimes called Powerline) where data is carried over your domestic AC mains wiring. Each has its pros and cons, so let's kick off by discussing some of these, starting with a traditional wired network (more correctly referred to as a local area network or Lan).

Virtually every PC or laptop you can buy will have an adapter for cabled networking built in, making it a cheap and attractive option. The switches to which the adapters

have to be cabled are affordable now too. A small, five-port switch, for example, can cost less than £30. Bandwidth is unlikely to be an issue, with Gigabit networking standards (1,000Mbps/sec) commonplace on most products. The only major drawback is the need to run cables everywhere.

Trail wires across the floor and the result can be messy and hazardous, but a proper installation that tidies the cables away will be expensive, even if you do it yourself. On top of this, it's almost inevitable that, however

'However many you have, cabled ports will never be in the right place'

many you have and wherever you put them, cabled ports will never be in the right place.

Wifi is a lot more flexible because it requires no cables or fixed ports. And that now makes it the preferred technology for most home and small-business networks, with service providers increasingly bundling wireless routers as part of their broadband packages. But not all PCs come with a Wifi adapter as standard. Most notebooks do, but not desktops, which adds to the cost.

Wifi bandwidth can be an issue too. The latest 802.11n (also referred to as draft-N or Wireless-N) products are pretty fast, delivering real speeds of around 100Mbps/sec, but that's still far short of what a cabled Gigabit network can do.

Range is another issue with Wifi, although there are several ways of extending wireless reach, such as adding extra wireless access points or using wireless 'bridges' to link different Wifi networks together. But because these can be complex and expensive to install, many users opt for Homeplug, which uses the AC mains wiring in your house or office to network devices together.

For example, you can run an ordinary network cable from a router to a Homeplug adapter in a nearby socket, then plug in a Homeplug Wifi extender almost anywhere else in the same property. Wifi notebooks within range of the extender can then connect to the router, with data between the two units carried over the AC cabling.

Homeplug can also be used to build complete networks without Wifi, although the bandwidth isn't fantastic. The latest Homeplug AV products, for example, are rated at 200Mbps/sec, but in practice deliver less than half that. Still, they compare well with Wifi and are ridiculously easy to install: just plug them in and they work, finding each other and building a network without any user intervention.

Homeplug networking isn't without issues. Despite its popularity, few products have Homeplug technology built in (yet) and the adapters are still expensive compared with Wifi alternatives.

Be wary of compatibility claims too. Interoperability between manufacturers isn't a problem but the latest Homeplug AV devices (up to 200Mbps/sec) can't be used with earlier Homeplug 1.0 products (up to 85Mbps/sec). They can be used alongside each other but can't communicate together. See the Networks column in the August 2008

For maximum bandwidth you can't beat a traditional cabled network with, at its heart, a Gigabit Ethernet switch



Cable matters

Be careful when buying network cables as there are two types. Most are wired straight through and it's these that are used to connect PCs, servers, printers and other devices to switches. Such cables are often called 'patch' cables, but you can also get 'crossover' leads, which can be used to network two PCs together without a switch.

Many modern switches can detect the type of cable and work with either, but not all. So if you're having problems, first check the type of cable: retail crossover leads usually have this information stamped on the plastic sheathing.



Homeplug adapters are very easy to install, plugging into mains sockets and using the AC wiring to communicate

issue of PCW (online at www.pcw.co.uk/2222804) for more about the practicalities of Homeplug; you'll also find a copy of it on this issue's cover disc.

Finally, don't assume that you have to stick with just one of these technologies. It's fine to mix and match cabled, Wifi and Homeplug networks to suit your needs. A Wifi router, for example, will also have cabled ports to which you can attach PCs, cabled switches and Homeplug adapters. Sure, there are differences when it comes to setup and management, but all support the same networking protocols and applications and can be made to work together easily.

What routers do

The type of network technology you use will usually be determined by your router, which is typically provided by your ISP as part of a broadband internet package. But do you know what a router really does and what to look for?

A router is a bit like a switch in that it forwards traffic around a network. However, there are major differences in how both devices do that. For example, a switch is designed solely to forward traffic on a local network; it only has connections to the local network and if it gets a chunk of data (a 'packet') addressed to a system on a 'foreign' network it won't, by itself, be able to do anything with it.

A router, by contrast, will have connections to multiple networks. Most home routers will be connected to both the local network and the internet, via an ADSL or cable broadband service (nowadays some routers can even support 3G mobile broadband connections). Routers can direct or 'route' traffic differently, depending on how the packets are addressed. Packets addressed to other local devices, for example, are kept on the local network while those addressed to 'foreign' networks will be routed out onto the internet to be, possibly,

further forwarded to their ultimate destinations by other routers. In simple terms, the internet is just a huge collection of routers enabling connections between millions of local networks such as your own home network.

Don't worry too much about how a router 'learns' how to direct network traffic. All you need to know is that on most networks the router is, effectively, a shared gateway enabling all the devices on the Lan to

'A router lets all devices on your Lan connect to the rest of the world'

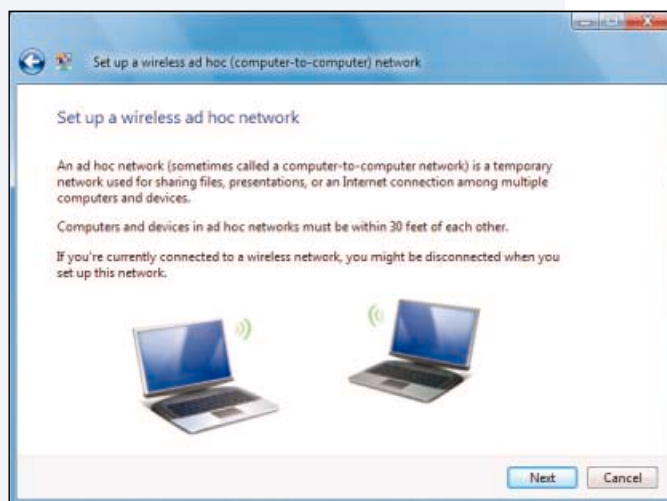
connect to the rest of the world via a single internet connection. Every bit of traffic in and out passes through it, so a router is a good place for other common network tools and technologies to be sited.

Most internet routers, for example, will have a firewall built in, plus a variety of other optional add-ons such as anti-virus scanners or content filters to protect Lan users from common internet threats. A router makes a good home for DHCP (more about this later) and virtual private network (VPN) servers, to enable remote users to connect to the Lan over encrypted internet 'tunnels'. You can get routers with Voice over IP (VoIP) gateways built in, to let you route phone calls over the internet, and so on. All in all then, routers are important bits of kit on any home network.

Why not ad hoc?

You can build a Wifi network without a wireless router or access point. Called ad hoc networking, client Wifi adapters can be set up to talk directly to each other on a peer-to-peer basis.

However, ad hoc networks are more difficult to manage and to secure, and you'll need different settings if you want to connect to other 'infrastructure' networks and public hotspots. Nor do they save much money as you still need a router or gateway of some kind to provide shared internet access.



Ad hoc networks can be set up without using a Wifi router or access point, but they aren't necessarily a good idea

Network addressing

So much for the hardware. It's time now to cover a little networking theory, starting

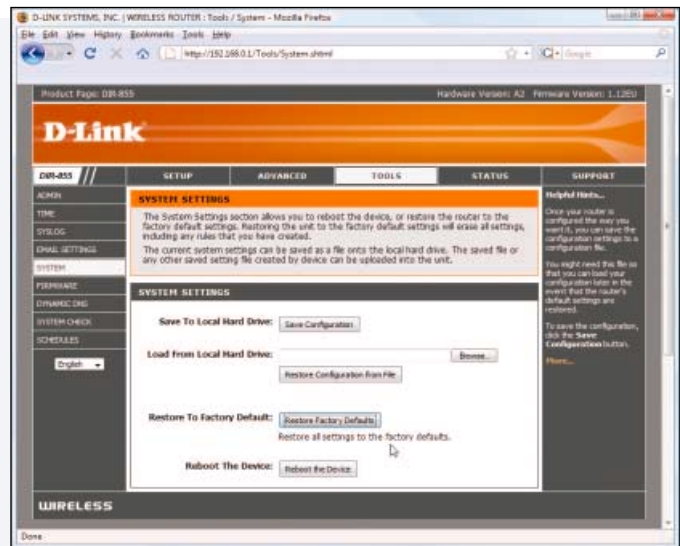
When routers go bad

Routers can and do go wrong. Fortunately, their settings are held in non-volatile memory, so switching them off and back on again usually fixes most common faults.

If this doesn't work, it may be because you have changed the configuration. In this case you should reset the router to its factory defaults and start again. With some devices you can do this from the management interface, using a browser. In others there will be a hardware reset button. Check the manual for details.

Routers do an awful lot of processing work and can get quite warm, so make sure they've got adequate ventilation and that any cooling grilles have not been covered up.

If you mess up while configuring your router, look for an option to return it to its original 'factory' settings and start from the beginning



with addressing. Networks these days use a protocol called TCP/IP (short for Transmission Control Protocol and Internet Protocol) that requires every networked PC, server and other device to be configured with a unique identifying number: its IP address. The address is typically 32 bits long, and expressed as a set of four decimal values between 0 and 255, separated by full stops.

For example, the PC I'm writing this article on has an IP address of 192.168.0.10 while the router that connects it to the internet (referred to as the default gateway) has an address of 192.168.0.1.

IP addresses can be manually assigned, and for devices such as routers and servers this is the best approach as you don't want

their addresses to change. However, if you make a mistake you can end up with duplicate addresses, which isn't good, so for everything else it's better to assign addresses automatically using the Dynamic Host Configuration Protocol (DHCP).

DHCP hands out addresses from a preset range that avoids duplicates, and you can also use it to tell client PCs the address of the internet router. It's really useful, especially with a mobile notebook or PDA, as it lets you connect to different Wifi networks without having to manually change the gateway address every time.

On the downside you'll need a DHCP server, but most routers now come with one built in, so this isn't a major issue. The DHCP

server will normally be turned on by default, so all you have to do is ensure your network PCs are configured to obtain their addresses automatically. Again, that's now the default when Windows network connections are created. If not, it's very easy to change.

For most home networks DHCP is a no-brainer, as it just works. Things can go wrong, though, for example if you have more than one DHCP server on the network. DHCP servers can be built into all kinds of devices, so if problems arise check if that's the cause and turn off any you don't need.

Lost in translation

One of the big issues with IP addresses is the number that can be defined. With just 32

Free routers, what are they good for?

You've received a router as part of your broadband deal, but could you do better? For most people the answer is 'no' as the router they've been sent is guaranteed to work and is easily fixed or replaced, often free of charge; some service providers can even connect and manage their routers remotely. An ISP is unlikely to offer technical support for a router that you buy yourself, even if it works perfectly with the service.

Only consider a router of your own if you need its extra features – for example, if you've been given a single-user ADSL or cable modem rather than a router, or you'd like to add Wifi to your network. Likewise you may want extra features such as virtual private network (VPN) remote access or Voice over IP (VoIP) facilities, but bear in mind that you can add these in other ways (via dedicated software or hardware appliances, for example) if needed.



A replacement router such as the Vigor 2820Vn from Draytek may have extra features including VPN and VoIP facilities, but if you don't need them stick with what your ISP sends you

Which addresses?

On a private home or small-business network you can use any IP addresses you like, but the DHCP server inside most routers will be preconfigured to use officially reserved ranges. These can vary but, typically, will be in the format 192.168.0.xxx, 192.168.1.xxx or possibly 10.0.0.xxx, allowing you to have up to 254 devices on your Lan with numbers from 001 to 254 replacing the 'xxx' part of the address. By convention the router itself will have an address ending in 001 (the default gateway). You can change to a different scheme but unless there's a good reason it's really not worth it.

data bits to play with, the current technology (referred to as IPv4) can accommodate around four billion unique numbers. But because of the way addresses have been allocated in the past, there are a lot fewer than that available and nowhere near enough to cope with the explosion in internet use. A new 128-bit addressing scheme (IPv6) is being implemented to fix this, but in the meantime most home and small-business networks use something called Network Address Translation (Nat) to skirt the problem.

Nat is a complicated technology but a simple concept and easy to use. Most home users don't even know that it's there at all.

It's all done at the internet gateway (your internet router), which will have at least two network interfaces: one attached to the Lan and the other the internet, sometimes called the Wan (wide area network) interface. With Nat, only the Wan interface needs to have a

unique IP address visible to the world (a 'public' IP address). The local devices can have any addresses ('private' addresses), with the Nat software inside the router translating those local private addresses to the public address assigned to the Wan port and back again as data packets pass in and out.

'Anything in the DMZ will be treated as if directly connected to the internet'

With Nat there's no need to allocate globally unique addresses to every device on your Lan. It's common practice to use the same addresses as millions of other people with home networks. That's because when it comes to communicating over the internet the only address used will be that assigned to your Wan connection by your service provider,

which is why a router can be shipped with a default private IP address and be expected to work on any network.

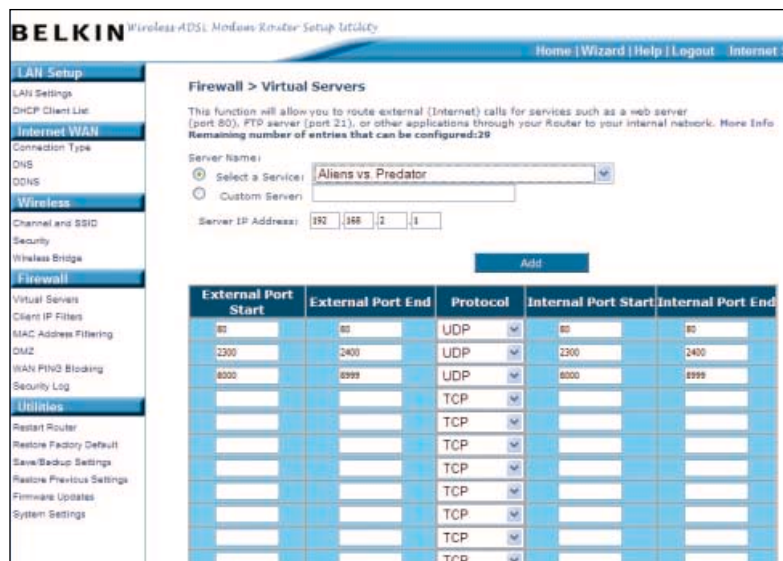
Nat enables the internet to function using 32-bit addresses, which is great. On top of that, it provides a degree of protection against hackers and other intruders who never get to see the IP address of anything on your Lan. It's often called a Nat firewall.

That said, Nat by itself doesn't provide complete protection against hackers and other threats (see box, below). You also need to take extra steps to provide remote access to your Lan or if you want to host web or email servers behind a Nat-enabled router. And that leads us onto the subject of demilitarized zones and port forwarding.

Getting through Nat

When a Lan user initiates a connection to the internet, Nat works really well, remembering the local address so that incoming data to

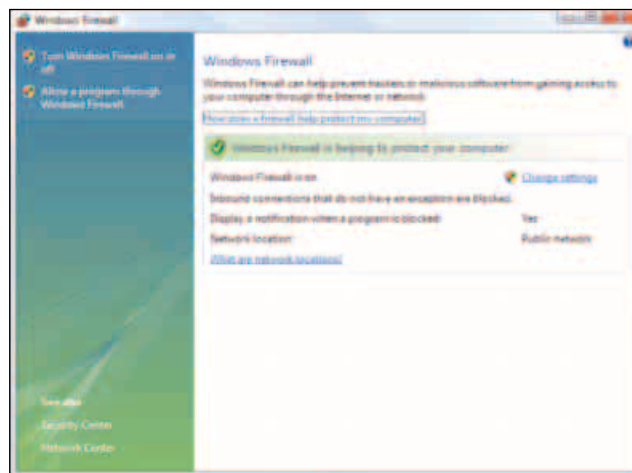
You can configure your router so, for instance, all port 80 traffic is sent to your local server



What's a firewall?

A firewall is software that sits between your local network and the internet inspecting the data traffic passing between the two to protect local users from hackers, trojans and other common threats. At its most basic a firewall will be configured to block all unsolicited inbound traffic, but that really doesn't provide much protection. In addition, therefore, most firewalls can scan for tell-tale signs of common attacks and block them when detected. More sophisticated firewalls can be further programmed to block specific protocols, shut down unused ports, prevent access to blacklisted websites and so on.

Virtually all modern internet routers have a firewall of some kind built in. However, most are pretty basic and may not be fully activated by default, so it's worth checking what you've got and whether it's turned on. Bear in mind too that this kind of firewall will only protect PCs while they are attached to the Lan. If you take a notebook out and about and connect to other networks, a software desktop firewall such as the one provided in Windows will be required, as will anti-virus and other standard security software.



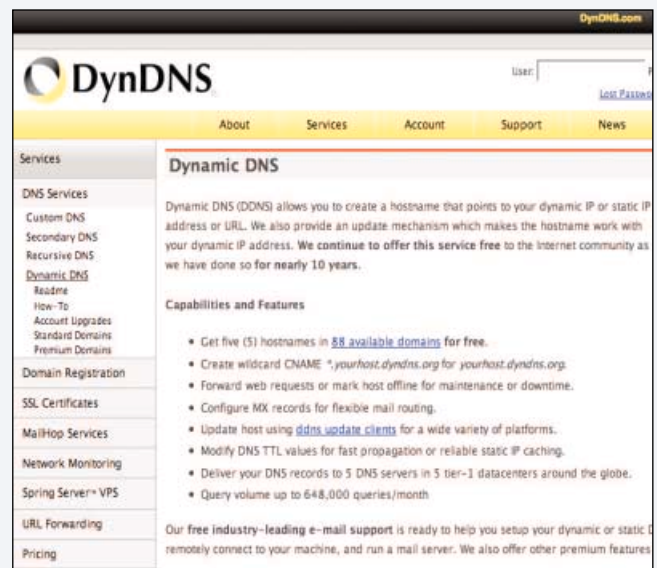
The firewall in your router only protects the Lan – additional protection is needed for notebooks connecting to Wifi hotspots and other networks

Do you need a dynamic domain name service?

If you want to connect to your home network remotely, you need to use its public IP address or, better still, a domain name that can be resolved to that address using DNS, the Domain Name System. Unfortunately, most public IP addresses are assigned dynamically, so your address can and will change over time. One solution is to use a dynamic DNS (DDNS) service to update the address associated with your domain when that happens.

Numerous DDNS services are available, many free, such as DynDNS (www.dyndns.com). All work in much the same way, using a network client to check your public IP address and update your DNS records on a regular basis or when changes occur. Some internet routers will have a DDNS client built in, otherwise you'll need to download a client from the provider and run it on a network PC.

Dynamic DNS can be used for remote Lan access and to host public websites and email servers. However, compatibility can be an issue with built-in hardware clients, and with many of the free services you're limited to using an existing hosted domain, such as <http://homedns.org>, for example, a domain maintained by DynDNS. To use your own custom domain name you're likely to have to pay extra, in which case you might want to switch to a fixed address instead. Not all providers offer this option but many do, either for a small monthly fee or in some cases no extra charge at all.



A free DDNS service such as DynDNS can check regularly whether your public IP address has changed and update your DNS records if it has

that address can be automatically forwarded to the correct network device. But when the connection is initiated from outside, the Nat server has no way of knowing which local system to forward it to. While this is good news if it's a hacker trying to access your system, it's bad if you want to host your own web or email server or connect to your network from a remote location.

One way around this issue is to set up a demilitarized zone (DMZ) on the router to which you can connect things such as web, email and VPN servers. The rest of the network will still be Nat-protected, but anything in the DMZ will be treated as though it were directly connected to the internet with separate public addresses.

A DMZ can be implemented using separate Wan interfaces or in software, but very few home routers will have this as an option, plus you'll need additional public addresses for which there might be a charge (see box, above). A more common alternative is port forwarding. This is where you simply tell the Nat server to direct all traffic received on a particular port to a preset local address.

Forward those ports

Ports are extensions to IP addresses used to define the type of information being transmitted (we covered ports in the Hands On Networks column in the March 2007 issue; you'll find a copy in the PDF on your cover disc). Packets sent or received using port 80, for example, will, by convention, contain data being used to surf websites

using the HTTP protocol, while port 25 is used to handle SMTP email messages, port 110 for Pop3 message retrieval and so on.

On most routers, therefore, you can configure rules to forward all port 80 traffic to your local web server and direct port 25 and 110 traffic to Exchange or whatever email server you're running. Exactly how you go about configuring these rules will depend on the router involved, but in most cases it's simply a matter of choosing the type of traffic or port to be forwarded, then choosing a host from a list of those found on the Lan.

One of the advantages of port forwarding is that it lets you get away with having only one public IP address and it doesn't have to be fixed. However, if you've paid for additional addresses to assign your servers, some routers will also let you direct all the traffic sent to that address to a local system behind the Nat firewall.

Putting it all to work

That's all the space we've got to talk about home network basics. Unfortunately, it doesn't leave much room to talk about using your Lan once you've created it. Fortunately, Windows comes with lots of networking tools built in, allowing you to connect to both cabled and wireless networks and share files and printers. We've covered the basics for both Windows XP – and now Vista users – at some length in the Hands On Networks section of the magazine and included a number of relevant back issue reprints in PDF format on the cover disc. We've also included articles on

network troubleshooting and discussions of things you can do with your network once it's in place.

It's all there. Now it's up to you to give it a go and start to take control of your home network. To get you in the mood, there's a workshop on the following page showing you how to make sure your Wifi wireless network is protected from unwanted intruders. You'll also find lots of other practical workshops in your free *Ultimate Guide to Home Networking* ebook included on this month's cover disc.

Further reading

On your free cover disc

Ultimate Guide to Home Networking – 87 pages of workshops, ideas and practical advice

Hands On Networks – 14 pages of networking advice from previous issues

Online articles (with PDF versions)

Build the ultimate home media network

www.pcw.co.uk/2189086

DIY Windows Home Server

www.pcw.co.uk/2225856

Home network harmony

www.pcw.co.uk/2228736

Getting started with home networking

www.pcw.co.uk/2200556

Wifi without worries

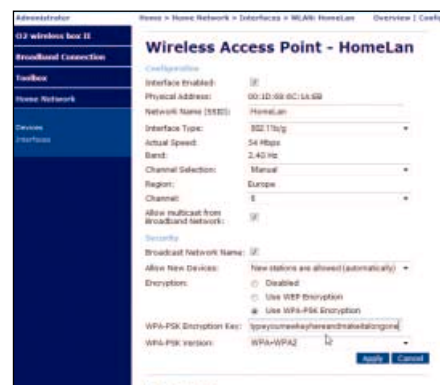
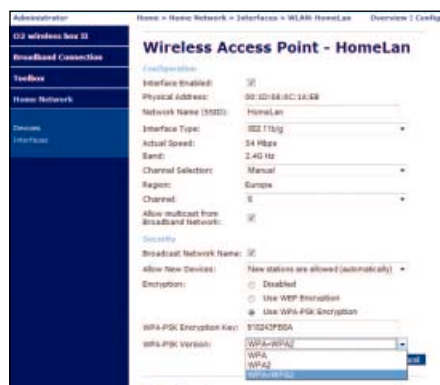
www.pcw.co.uk/2197734

See all our home networking features at

www.pcw.co.uk/features/home-networking

Beef up your Wifi security

Security remains one of the biggest Wifi worries, but home routers often come with low-security settings as the default to ensure maximum compatibility and a trouble-free 'out of the box' experience. In this workshop we look at how you can beef up the level of security on a typical home Wifi network

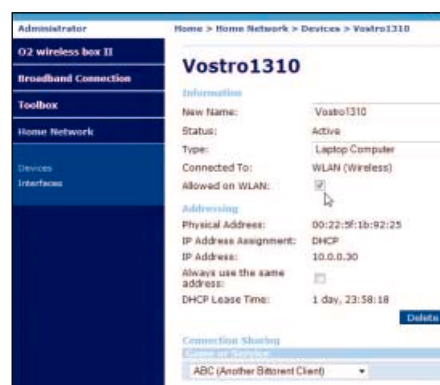
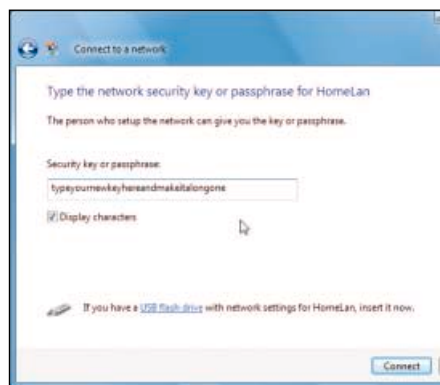


1 Like most Wifi routers, this one is managed from a browser and when first installed is configured to use basic Wep (Wired Equivalent Privacy) encryption to protect users. Better than nothing at all, Wep is widely supported on most Wifi notebooks and adapters but is relatively easy to crack. We want to switch to WPA (Wifi Protected Access) instead or, better still, the later WPA2 security as these protocols use much more sophisticated encryption technologies.

2 Some routers will support WPA or WPA2 Enterprise, but the Enterprise protocols are designed for large companies with dedicated authentication and key management servers and should be avoided. Instead, home users should choose WPA or WPA2 Personal, often referred to as WPA-PSK (short for Pre-Shared Key), where you manually enter a key to scramble your data. On this router, we can choose just WPA2 or, if we need to support older notebooks and adapters, a mix of WPA and WPA2.

3 The key used by WPA and WPA2 can be anywhere between eight and 63 characters (letters or numbers – the longer and more random, the better) long. More advanced users can type their key in hexadecimal, but you don't get anything extra from this approach.

Some routers will suggest a key or let you generate a random key from a more intelligible passphrase. You will need to enter the same key into your clients, so make a note of it. Some let you store keys on a USB stick, but it's still worth jotting down too, just in case.



4 We've left the router to broadcast the network name as turning it off causes problems connecting to the Lan and isn't much of a security measure anyway. Notice, however, that we have taken the option to allow new stations to connect only after they've been registered. Also referred to as Mac address filtering, this is a common option whereby new Wifi clients have to be manually identified (using their hardware-based Mac address) before the router will let them fully connect to the Lan. Typically, a separate menu will show the clients that have tried to connect, from which authorised addresses can be selected.

5 We now have to configure our wireless clients to match the enhanced security of the router. In this example we're using a Dell Vostro notebook running Windows Vista. Having taken the option to view available networks, we have identified 'HomeLan' on the Wifi router and clicked the Connect button. We're now being prompted to type in the key we entered back in Step 3.

6 Remember how in Step 4 we took the option to allow only registered stations to access the Lan? Once the router has identified our notebook, here's where we can opt to allow or disallow access. Note also that, by default, the DHCP server in our router will give this client an address automatically (we're using the 10.0.0.xxx range of addresses) and there's an option to ensure it always gets the same one. We wouldn't take this option here, but it could be useful for things such as printers and servers where you don't want the IP address to change.



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Troubleshoot codecs

They may be small and forgotten pieces of software, but as Tom Royal explains, audio and video codecs can cause you major grief when they don't work properly

Once upon a time, computers and multimedia files didn't get along particularly well: bleeps and pixellated images aside, your average PC didn't ever do much with video or audio. Today, of course, things have changed: we're all used to streaming videos almost instantly from the web, listening to music and opening all manner of multimedia files, and most of the time these files will simply play with no extra effort needed. But then, every once in a while, something goes wrong.

Usually this problem occurs after downloading a video file and opening it: Windows Media Player launches as usual, but then refuses to play the file. Annoyingly, there's often very little information given about what's gone wrong, but this is almost always a problem with codecs (an abbreviation for coder/decoder) – the tiny bits of software that decode each type of multimedia file. In this latest in our series of 'back to basics' features, which are intended as an introduction for novices and refresher courses for more experienced readers, we'll explain how to find out which codecs are installed on your PC, how to add more, how to disable them when they go wrong, and how to work out which are needed to play any given multimedia file.

Spot the problem

There are several warning signs of a problem with codecs. Most obviously, when opening a video or audio file in, for example, Windows Media Player, you might see a warning dialogue box stating that 'Windows Media Player cannot play the file'. When attempting to open a video file you may, alternatively, find that only the sound plays, with Media

Player displaying a placeholder image where the video should be. Finally, video or audio files may stutter, 'tear' or appear discoloured. Any of these problems can be a symptom of a faulty or missing codec, although bear in mind that other system errors can also be at fault. If one type of video file appears stuttering and in garish colours, for example, it's likely to be a codec problem, but if all video files appear this way then you should first check your graphics card drivers or even the physical connection to your monitor.

Windows relies on a variety of codecs from a range of different manufacturers to play a range of multimedia files, and these codecs are buried deep in the system itself: most live inside the \Windows\system32 folder. Given this fiddly installation system, it's annoying that Windows doesn't include a tool for managing them. This means finding out which codecs are installed on your computer, let alone working out which ones are causing problems, can be difficult.

A good first step for any codec problem is to install a codec analysis program. One of the best is the free tool Installed Codec, which you can download from www.nirsoft.net/utis/installed_codec.html.

Run Installed Codec and (after confirming the UAC prompt if you're running Vista) you'll see a list of all the

Windows Media Player will usually warn you if it can't find the necessary codec

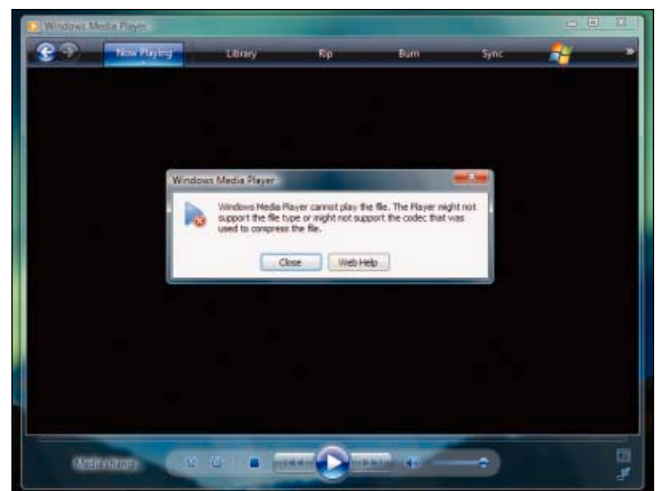


codecs listed in the Windows Registry. Most usefully, the program checks to see whether each one is physically present and, as shown in the screenshot on the opposite page, will mark any that are missing with a red highlight. If a codec is marked as missing, right-click its entry and select Properties. This displays all the information recorded in its

'We're all used to streaming videos almost instantly from the web'

Registry entry, including a full name and filename – putting either or both into Google will often be all you need to find and re-download the codec in question.

Another useful tool built into Windows is the ability to list codecs in the order they were installed. This is particularly handy if you have media files that used to play



correctly, but now fail to open. If this is the case, click on the 'Installed/Modified time' column to sort by date, and check to see if any codecs have been installed recently. If a new codec has been added recently, try right-clicking it and choosing Disable Selected Items from the menu before trying the file again.

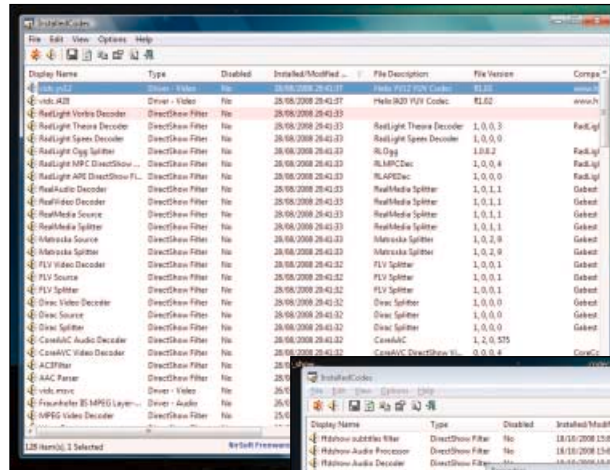
Removing individual codecs manually isn't very easy, but then it's rarely necessary. Most codecs used by Windows are known as Direct Show Filters, and will be identified as such by Installed Codec. To remove one, use Installed Codec to find its filename and location (such as c:\path\filter.ax), then use the regsvr32 tool to de-register it as follows: open a command prompt, making sure to elevate to Administrator rights if running Vista, then type **regsvr32 /u "[drive:]\[path]\[filename.extension]"** (Key: $\backslash$ code string continues) replacing the terms in square brackets as appropriate for the codec in question (see picture, right).

Add it up

If all the computer's codecs are present and correct, but you still find that some media files won't play, then normally it's an indication you may need to add a new codec. This can, in some circumstances, be simple enough: play a common video file in Windows Media Player and it should be able to prompt you to download and install the necessary files. In other cases, though, there's often very little clue given as to what kind of video or sound is contained within a file, let alone what codec is needed to play it.

The most common cause of this problem is AVI video files. Contrary to common opinion, AVI is not a type of video or video compression, so there's no such thing as 'a codec to play AVI files'. Instead AVI is a container format (it stands for Audio-Video Interleave) that can hold many different types of audio and video streams, from simple but inefficient types such as Motion JPEG (M-JPEG) to more advanced ones such as MPEG-4, and each of which requires its own codec. If you have an AVI file that won't play, the first step is to work out what kind of video and audio it contains, and the same technique can be helpful for other cryptically named files too.

There are many tools available that analyse a multimedia file and display which codecs – often two, one for the video and one for the audio – must be used to play it. One of the best is the open-source tool Media Info (<http://mediainfo.sourceforge.net>). After installing this, choose Open from the File menu or drag and drop a media file onto the address bar at the top of the window. Media



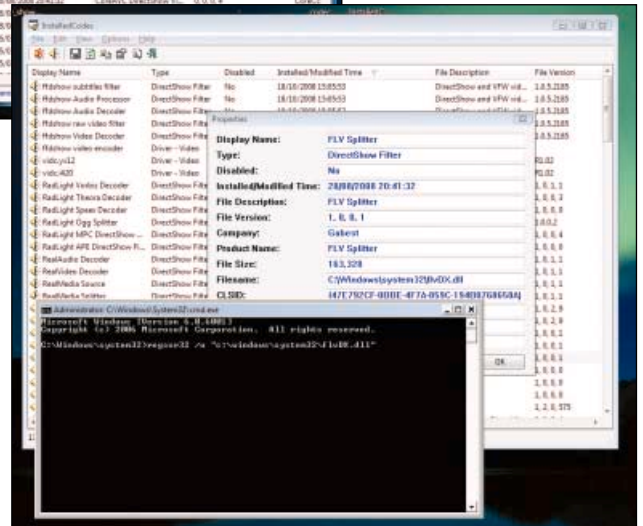
Left: Installed Codec highlights any missing codec files in red

Info will read the metadata inside the file and, in some cases, will immediately present you with buttons marked 'Go to the website of a player for this file', 'Go to the website of this video codec', and so on. If this happens, follow the links to install the software and try playing the file again.

If these buttons aren't available, choose HTML from the View menu. This generates a neatly formatted page of information about the file: scroll down and look for the 'format' and 'format/info' fields under video and audio, and enter these into Google or your favourite search engine – armed with this information on what type of formats you need to decode, finding a suitable codec is normally simple.

Pack it in

This method for identifying individual codecs is very helpful if one or two media files won't play, but in some circumstances it is possible



Below: Once located, faulty codecs are easy to de-register from Windows

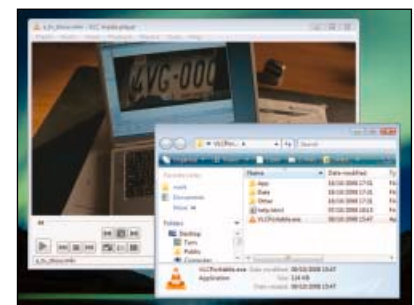
to end up with a computer that won't play dozens of different media files. In these cases installing each one individually can take a long time, so it's tempting to look for an all-in-one solution. To fill this demand, many 'codec packs' are available free on the internet, each claiming to add dozens of different audio and video codecs in one fell swoop.

This kind of codec pack can be helpful, and we've included one – the K-Lite codec pack – on the PCW DVD this month in case you'd like to use it. Before doing so, though, bear in mind that, like any codec pack, this

Codecs be gone

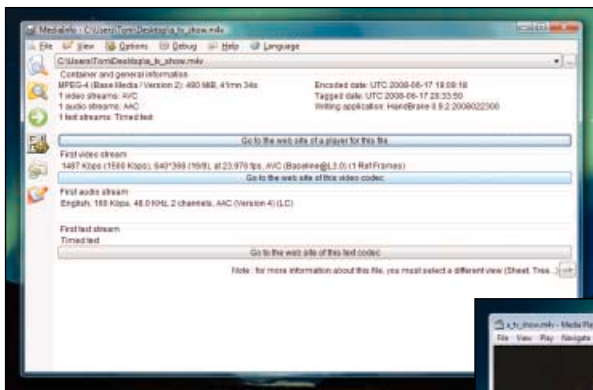
If you've tried and tried but just can't get the right codecs to play a media file, there is one simple alternative: try a player that includes all the codecs it needs. One excellent example is VLC (downloadable from www.pcw.co.uk/2144343), which is already extremely popular among Linux users for its ability to play the MPEG-2 video used on DVD discs. VLC will play a staggering number of video files without requiring any extra codecs, as it includes much of the same technology (ffmpeg) as ffdshow.

There's also an excellent portable version that can be stored on and run from a USB memory drive (www.pcw.co.uk/2213565). Another good alternative is Mplayer. Like



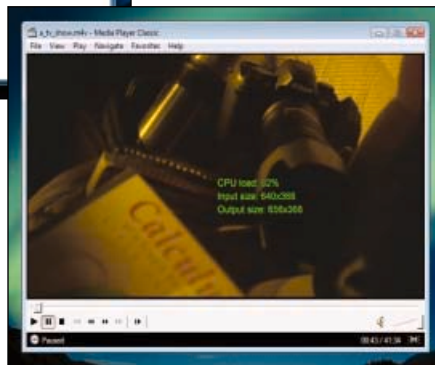
VLC Portable includes the codecs needed to play most files

VLC this program is popular on Linux systems but a Windows version is now available from www.snipurl.com/4h89c.



Left: Mediainfo will often be able to provide a link to the necessary codec

Below: Use ffdshow's OSD tool to monitor whether effects can be added without stuttering



installs a large number of files into the Windows system folders and modifies the Registry, so we'd always recommend doing a full system backup first just in case something goes wrong.

In addition, there's an element of trust involved: only install a codec pack if you trust the team developing it not to do anything untoward to your computer. The idea of viruses disguised as media codecs is not new and, although many such scams rely on users willing to download a 'codec' that purports to display adult videos, for example, this is not always the case. If in doubt, search the web for information and reviews of a codec pack before downloading, and scan it for viruses in the normal way before installing.

Show and tell

Another way to prepare your PC for playing many media files, but without installing a huge codec pack, is to use a free tool called

'The idea of viruses disguised as media codecs is not new'

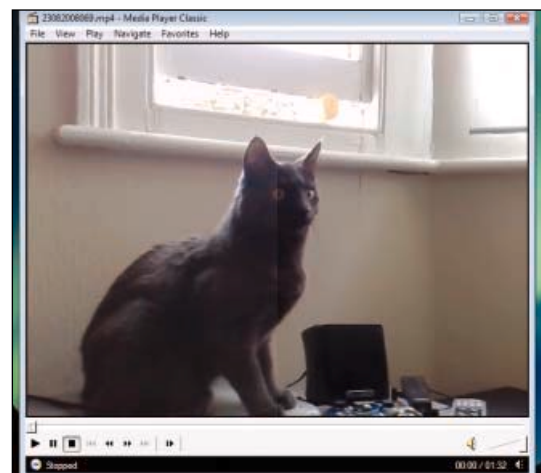
ffdshow. Ffdshow is distributed under the Gnu Public License (GPL), and can decode many types of audio and video, including MPEG-4 of the type used in DivX and XviD video files. When installing the software you'll be presented with a list of all the media types that it can decode, allowing you to select those that you want it to handle. It works particularly well with Media Player Classic (available to download from www.pcw.co.uk/2129046), which provides a small, simple interface to its advanced decoding features, but can also be used with other player tools.

With both programs installed, look in the Start menu and then the ffdshow program group. Inside you'll find a shortcut called 'Ffdshow Video Decoder Configuration', which can be used to apply all kinds of filtering and effects to videos as they are shown. In particular, check out the 'Resize and Aspect' setting, which can upscale and

resize videos on the fly, as well as 'Blur & NR' and Postprocessing, both of which can help improve the look of upscaled videos. The postprocessing option is also particularly good for giving a quick fix to poorly exposed videos – to see the difference it makes, enable the option at the top of the settings to apply processing only to the right-hand side of every video clip.

Two things are important when setting up and using ffdshow. First, some of the effects it produces can be taxing, particularly on slower computers. When setting it up, always enable the OSD (on-screen display) option and set that to display the CPU usage – this will overlay the processor usage on top of videos as they play, so you can spot whether busy sequences are going to push the computer too hard and cause playback to stutter.

Use the split screen to see how ffdshow's postprocessing changes a video



Second, remember that in order to apply any changes made to the ffdshow settings in this manner you'll need to reopen the video in Media Player Classic – stopping and restarting the video will not apply the new rendering settings. Once you've tweaked the options to your liking you can enable and disable the different effects instantly by right-clicking the ffdshow icon in the system tray and choosing them from the menu that appears.

Back to basics

As you will have noticed, it's unfortunate that neither Windows XP nor Vista includes the tools needed to properly manage audio and video codecs. This means, should you have a problem with the codecs on your system, you'll often have to rely on third-party tools to help resolve it. The good news, though, is that there are many good-quality freeware or open-source programs, such as those we've recommended here, to do the job. And although it's still frustrating to come across a video or audio file that won't play straight away we hope that, armed with this article, you'll be able to get it running in a few minutes. And finally, don't forget that our Hands On Sound column (see page 146) is there to help you with your audio-related problems. Email sound@pcw.co.uk and we'll see if we can help. **PCW**

Patently confusing

When it comes to video and audio codecs, there's one legal grey area to be aware of. Many of the most popular video formats of the moment, including DivX and XviD, are variations of the MPEG-4 standard, which incorporates several patented technologies.

In 2006 AT&T contacted several companies including Apple and DivX, stating that it held patents covering "a core component" of MPEG-4 and offering them a licence for the technology.

Whether they chose to pay is unclear, but no case for patent infringement has yet reached court.

In the meantime the XviD MPEG-4 codec continues to be freely available, but binary downloads are not hosted on the www.Xvid.org website and some believe it may not be legal to use in some countries. In practical terms, PCW is unaware of any cases, anywhere, where users of 'free' MPEG-4 technologies have been prosecuted.



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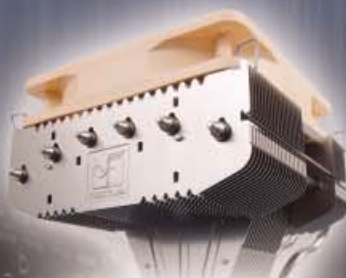
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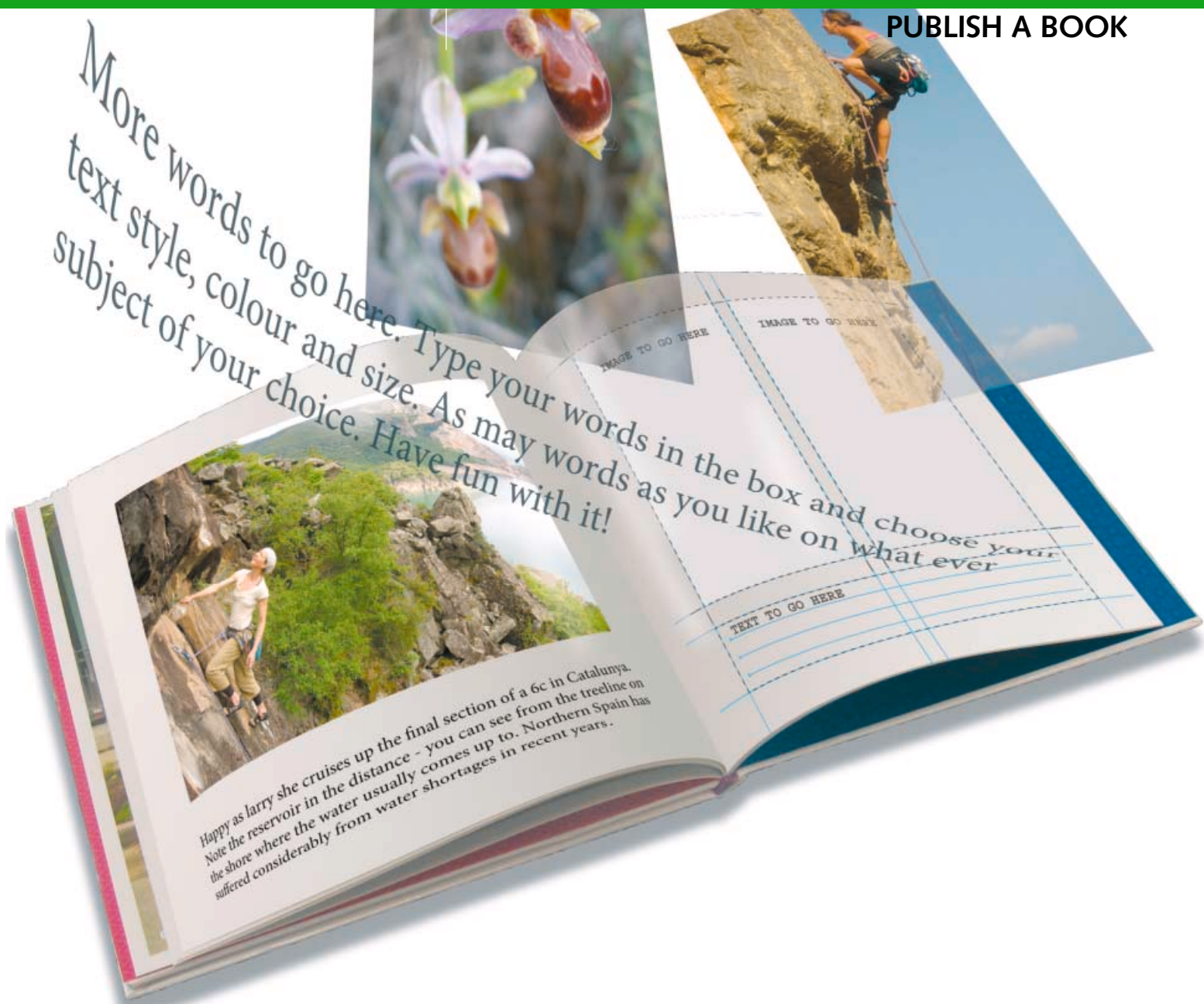
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The write stuff

Self-publishing has not had a very auspicious history, but modern technology makes it a popular option for aspiring authors, as Tim Nott explains

When William P Young wrote his guy-meets-God novel *The Shack* he had trouble getting it published. Its spirituality put off secular publishers whereas faith-based publishers found it too controversial. So Young sent it to friends, who were so impressed they set up a company specifically to publish it. A year later it was number one on *The New York Times* bestseller list and www.amazon.com.

Dreams of literary success are not the only

reason for self-publishing. You may be aiming at a niche market, such as an obscure academic discipline or an unusual hobby, where the potential readers will be few but highly interested. You may want to produce a manual for your company or a photo album just for friends or family.

This is where print on demand (POD) comes in. Instead of printing a stack of books, storing them, and sending them out to customers, the publisher prints a POD book only when an order comes in for it. Although

it costs more to print one book individually than in a run, there's no money tied up, no warehousing and the book need never go out of print.

We can't promise you a bestseller, but we can show you how to do it all yourself, and at minimal cost. The first part of this feature concentrates on getting your book into publishable form. The second looks at low-cost ways of turning your work into a real, ink-on-paper, professionally printed book using POD services.

Tools and tips for authors

First of all, and at the risk of stating the obvious, you'll need a word processor. The features required will depend on the nature of your book. For any form of writing you'll need a spelling checker. If you are writing a novel, then you will probably want a word count, search and replace, and page numbering, all of which have been around since the dawn of word processing.

For non-fiction, you'll want refinements such as an index, a table of contents, and footnotes or endnotes. This month's Hands On Word Processing covers indexing in detail (see page 142), and the November, December and Christmas columns covered the rest (all are available online at www.pcw.co.uk/tags/word_processing).

Although the Hands On tutorials are based on Microsoft Word, you should find that any competent word-processing application will handle the same tasks in a similar way. The free Openoffice Writer (which you'll find on your cover DVD or can be downloaded free at www.pcw.co.uk/2216030) offers all these capabilities.

Pictures

If you are using photos in your book, then you'll need to make sure they are the right size. Most photos benefit from cropping – cutting away areas of the image that you don't want – and you should ensure that the finished, cropped image has a print resolution of at least 300dpi (dots per inch). For example, a photo that is 6x4in on the printed page should measure 1,800x1,200 pixels.

You may also want to correct brightness and contrast, and fix other problems. There's

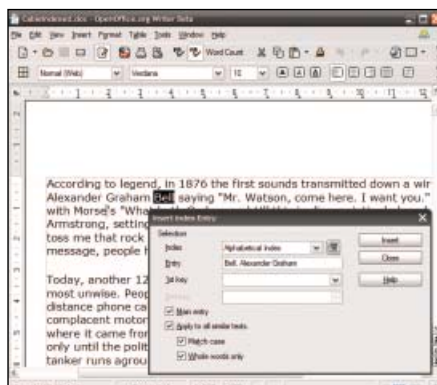
The legal side of self-publishing

A copy of every book published in the UK must be submitted to the British Library, free of charge and within a month of publication. In addition, five other legal deposit libraries are entitled to a free copy on request. For more information see www.llgc.org.uk/aldl and www.bl.uk/aboutus/stratpolprog/legaldep.

An International Standard Book Number (ISBN) is not required by law. However, booksellers, libraries and publishers use ISBNs for ordering, listing and stock control, so an ISBN is essential for marketing your book. Without one, a book won't exist in

any book database. Because of the way ISBNs are administered, the UK agency, Nielsen, only supplies ISBNs in packs of 10, so unless you're planning on publishing a load, you'll need to get the ISBN from the POD service.

Copyright just happens. As an author, you don't have to take any special action to secure the copyright to your book. However, you can assign it to a third party, or publish your work under a Creative Commons licence to put some or all of it in the public domain. For more information see <http://creativecommons.org>.



Indexing a book in Openoffice Writer

Layout

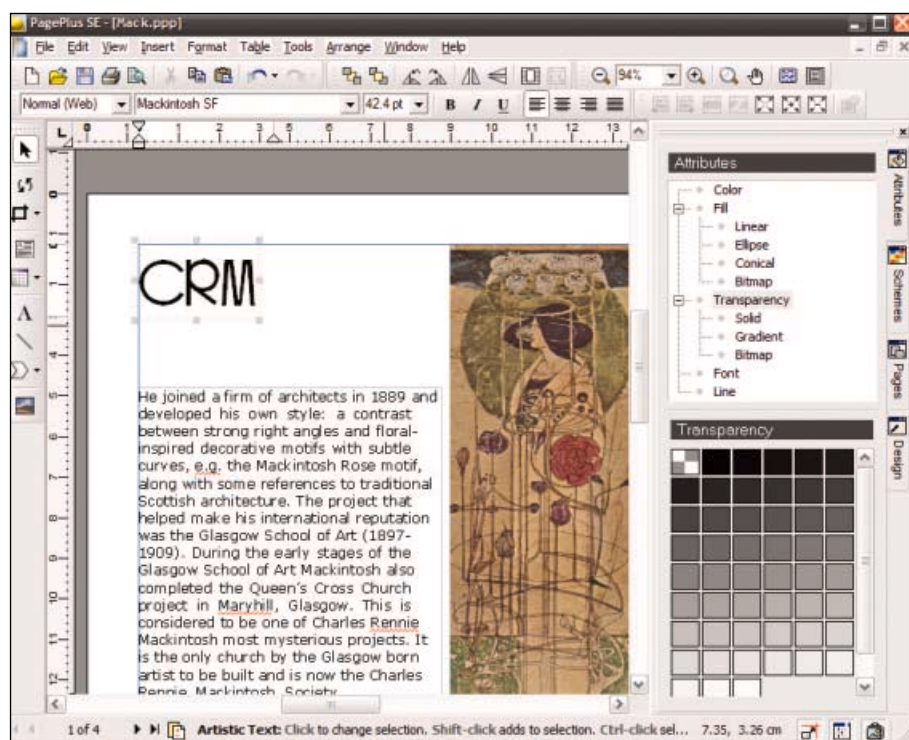
Although you can use them to create columned text, marginal text boxes, 'wrapped' illustrations and other design elements, word processors such as Microsoft Word and Openoffice Writer are not page layout programs. This may not matter for a novel, for example, but if precise control of layout, position of graphics, typography and general design elegance are important, you'd be far better off with a proper page layout or desktop publishing (DTP) application.

Professional software such as Adobe Indesign or Quark Xpress costs hundreds of pounds, although you can get budget programs such as Serif Page Plus, which is available in editions ranging from a free version to the top-of-the-range X3, which costs £79.99.

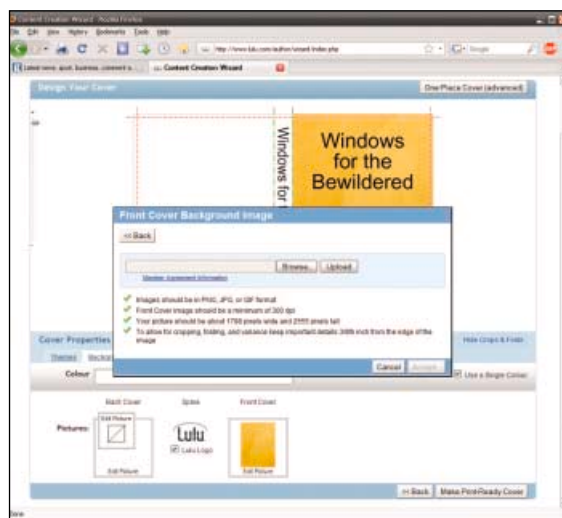
One great time-saver with DTP programs is master pages, which let you apply a preset layout to pages, complete with columns, sidebars and so on. You could, for example, have one master page for chapter starts and another for ensuing pages. If you used Word, you'd have to create section breaks and do much of the formatting by hand.

Cover

Although they say you can't judge a book by its cover, first impressions count. As we'll see later, some POD services let you design your cover online, but if you are serious about marketing your book, you'll need to invest a lot more effort – your own, or someone else's. Consider using a professional (see box on the next page). If you decide to go it alone, then you really do need page layout software. Download the cover specifications – Amazon's Createspace (www.createspace.com) and Lulu (www.lulu.com) both provide



Even budget DTP can make a big difference



Lulu offers useful advice on cover design

templates – and take your time. There's no shame in copying layout and design ideas from existing books, but you may only use images you have the rights to, either because they're your own creations or you've licensed them from an image library.

PDF

Adobe's Portable Document Format (PDF) provides a standard way of describing and printing documents that is independent of the software, operating system and hardware used to produce them. Some POD services, such as Lulu and the World Wide Association of Writers (WWAOW), let you upload DOC files and convert them into 'print-ready' PDFs. Others, such as Createspace, insist on PDFs.

The standard way of creating PDFs is to use Adobe Acrobat. The program costs over £300, which may be over the top for a one-

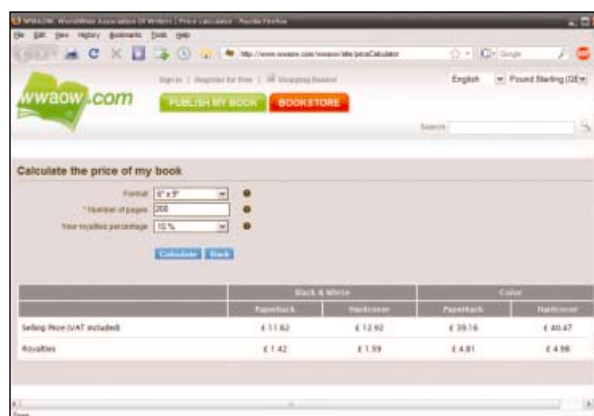
Work out the price of a book before you go further

off book, but there are alternatives. If you've created your book using DTP software, then it should be able to create PDFs. Some word processors, such as Ability Office and Open Office, can also produce PDFs and there's a free Microsoft add-on for Word 2007 available at <http://tinyurl.com/v46jc>.

A solution that works with any application is to install a PDF creator such as the free PrimoPDF, also available from PCW downloads. This installs itself as a 'printer', so is accessible from any application, but instead of producing printed output it creates a PDF file.

Publishing your work

Some on-demand publishers charge an up-front fee which can be substantial. Xlibris, for example, will want anything from \$299 (around £190) to \$12,999 depending on the type of book and the services you need. Fortunately, others don't, as they make their money by selling their authors' books and other merchandise. Probably the best known



is Lulu, which describes itself as a digital marketplace rather than a publisher.

There are others including Blurb, WWAOW and Createspace. Companies such as Cafépress and Qoop don't just deal with books, but also print on-demand calendars, posters, prints and T-shirts designed by members.

Lulu

Lulu takes a sleekly streamlined approach to creating a book. You choose a book format, binding type and colour options, and get a

'You add whatever you want to make as a royalty on each copy sold'

cost estimate once you've entered the number of pages. You then upload your file, and Lulu makes a print-ready PDF, which you can download and review. Next, you concentrate on cover design, and Lulu offers helpful advice on the size and file format required should you want to do this online, or you can download templates to do it offline.

Having got the production side over, it's down to business. You fill in a description

and other details and are given a final manufacturing cost for your book; our sample 356-page black-and-white A5 paperback worked out at £8.80 per copy. To this, you add whatever you want to make as a royalty on each copy sold. Lulu adds a further 20 per cent of your royalty as its commission, and that sets the retail price of the book. You get a last chance to review everything, then your book is published and available for purchase.

So far, it hasn't cost you a penny, but there's a further stage. You can choose to have the book 'published by Lulu' or 'published by you'. You don't have to choose either, but if you don't your book won't get an ISBN tag (an essential if you want to distribute it commercially). At the time of writing, 'published by Lulu' was free and 'published by you' (in the UK) was £79.95. The latter option names you, not Lulu, as the publisher and the ISBN is then assigned to you personally.

WWAOW

Unlike Lulu, which also deals in digital media, WWAOW (www.wwaow.com) deals only with writers and books. First, you calculate the price of your book, choosing a size and the percentage royalty you want to make over the production cost.

Getting expert help

If you're serious about marketing your book, or perhaps are just a perfectionist, then you probably already realise your limitations. You may be a superb writer, but even the best authors can benefit from proofreading and editing. Likewise, your design and layout skills may be competent but they won't match those of a professional, and you may also benefit from marketing advice.

Conventional publishing takes all these burdens off the author's shoulders, but help is available for DIYers too. Createspace has links to Booksurge, another Amazon company that offers professional services encompassing editing, design, public

relations and merchandising. Booksurge also offers publishing package deals, starting at \$4,599 for a work of fiction, which includes copy-editing, cover design, 25 printed copies and various promotional aids.

Lulu offers packages that include basic formatting (\$200) and cover design (from \$80). In addition, the Lulu Community Service Marketplace offers a range of services from independent experts.

In the UK, the *Writers' & Artists' Yearbook* has long been an invaluable resource for authors, and its website, www.writersandartists.co.uk contains comprehensive listings of professionals from agents to proofreaders.

It's also worth downloading and reading the publishing guide PDF. Next, read the author checklist – it's worth printing this off so you have everything you need, and all decisions made before you start. You can then hit the Publication Wizard, and fill in title, description, language, category keywords and author. You then upload your file, in DOC or PDF format, and choose size and colour options. Make sure the paper size set in your document file matches your chosen book size.

Next, you upload cover and author pictures, and decide on the binding, background and title style. There's little choice in cover design, and it doesn't seem possible to use a custom design. You then specify the percentage you want in royalties and identify or create a Paypal account to receive your royalties.

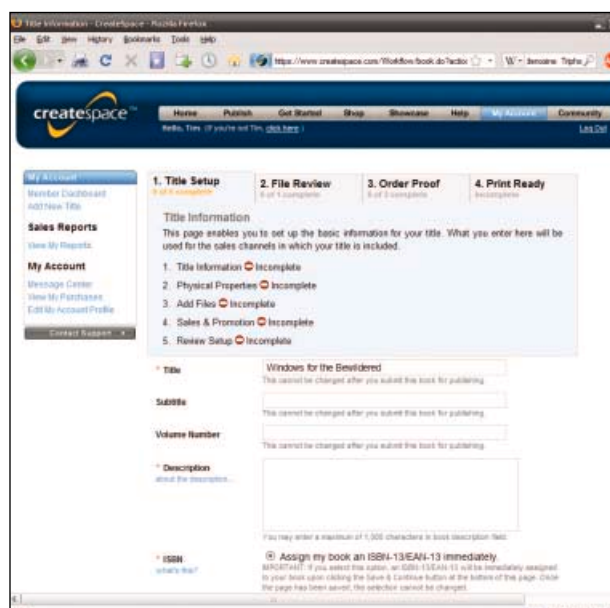
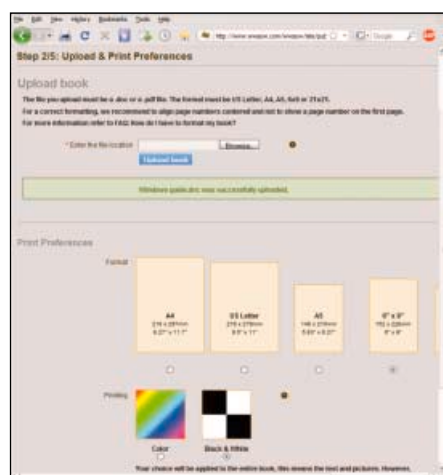
Having agreed to the terms, you have to buy five copies of your own book. Our sample worked out at £17.99 a copy, more than twice the price of Lulu. Although the publishing guide mentions that WWAOW will obtain an ISBN and barcode for an additional fee, no mention is made of this on the website or by the publishing wizard.

Blurb

Blurb (www.blurb.com) lets you do book production offline by downloading the free Booksmart application. Booksmart helps you create a book, with various sizes and design.

We were not impressed. You only seem to be able to import text from an existing file if you choose a black-and-white book; otherwise, it's strictly copy and paste. Even just with black and white, the 80,000-word DOC file that we used with WWAOW and Lulu brought Booksmart to its knees. That number of words equates to only about 250 pages of a paperback novel, so Blurb may be best suited to short, picture-rich books, such as a privately circulated wedding album.

However, there's a further annoyance. When you import pictures, you don't get thumbnail previews in the File Open



Reader, I fleeced him...

Self-publishing is a field rife with delusion and its close companion, extortion. So-called vanity publishing has long been inhabited by some of the more undesirable elements in publishing, eager to capitalise on the desperation of unknown authors to get into print. One site to keep an eye on is Writer Beware at www.sfwaweb.org/beware. It is run by the Science Fiction Writers of America, although its advice applies equally to other genres, and gives warnings of scams directed at authors.

dialogue, which is something of a handicap. And once you've uploaded a file, you can no longer edit it.

Had we been able to create our sample book, the printing cost would have been a reasonable £6.99. Blurb does not offer ISBNs for books.

Createspace

Amazon's Createspace requires rather more work. You have to register and you'll also need to submit your address and payment details upfront. To publish a book you first have to fill in title, author, description and other details. You also get the chance to have an ISBN number assigned at this stage, free of charge.

You then specify the physical options: these are limited to paperback and the largest size is 8x10in. Next, you upload the contents and the cover. Both of these must be PDFs, and the submissions guidelines page provides comprehensive instructions, though you'll

Upload and choose a format with WWAOW

Createspace assigns an ISBN to your book free

need to understand technical terms such as bleed and trim. There's no wizardry to help you in creating a cover, but you can download templates in Photoshop or PNG format.

The next stage is to decide on a price. Again, it isn't simple. Createspace tells you how much the book will cost to produce – in our case \$14.37 – to which you add the royalty you want.

So far, no mention of payment from the author has been made, but you are now told you can upgrade

to the Pro plan to keep more of the total price of your book and pay less for copies you order. This normally costs \$39, but the Pro fee is being waived until the end of 2008.

You also get to opt for Amazon.com retail sales, Createspace E-Store sales, or both. You get to keep more of the latter's book price, but the former reaches a wider public.

Having done this, you submit your book for publication. Createspace will review your submission to make sure it complies with the requirements, and then email you. You then order a proof copy at retail price, which need be your only expenditure.

Value and versatility

Of the four sites we looked at, Lulu is ahead on value and versatility. Blurb is really for creating short, arty books for yourself, although the dreadful software lets it down. WWAOW's production costs are high, and the question of ISBN assignment is a grey area. Createspace is more expensive than Lulu, offers fewer choices and isn't as easy to use, but its serious approach to design and ISBN assignment, and the clout of the Amazon name, make it a serious rival to Lulu if you want your publications to reach the widest audience.

While we'd be delighted to see a PCW reader get on the bestseller lists, the realities of POD are more modest. At the time of writing, Lulu's bestseller, the snappily titled *e-Start Your Web Store with Zen Cart*, had sold just over 7,000 copies. However, another Lulu title, *Finding the Can in Cancer*, had sold over 50,000 through bulk orders via a pharmaceutical company.

None of the sites we visited imposes restrictions on publishing elsewhere, so if your book takes off, you're at liberty to find a conventional publisher with lower print costs and a higher margin for yourself. **PCW**

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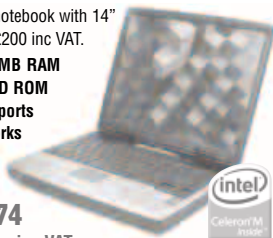
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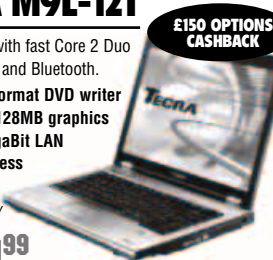
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- No power supply required
- Includes pouch case

Stock status: Brand new stock
Warranty: 1 year warranty

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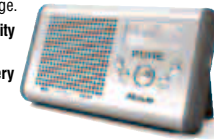
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Diary of a computer worm

Jon Thompson goes behind the headlines to expose the lifecycle of a computer worm

Computer worm writers are often seen as a breed apart: über-hacker loners with a hatred of society bent on pushing their own twisted agenda. But the truth is that it might not be maliciously inclined whizz kids who are creating today's worms. In fact, worms are easier to write than the simplest Windows application.

At its most basic, a computer worm is just a self-contained lump of code whose function is to spread between computers by replicating itself. There's no complex user interface to design, build or test. There are usually no complex file or database sub-routines to consider, either.

In contrast to commercial programs, worms do not have to observe programming standards, so the source code can contain the proverbial and unmaintainable 'spaghetti' programming. In fact, worm code need never be maintained at all, so there are no support issues to worry about either. If a worm crashes due to unforeseen circumstances or bad programming, it simply crashes. Depending on the writer's intent, if it takes Windows down with it, that may be a bonus.

With worm writing becoming easier, it's no surprise there are already several hundred species roaming the internet, looking for computers to infect.

Dissecting the worm problem

Unlike viruses, which attach themselves to host programs and only become infectious when that host runs, worms are independent applications, capable of traversing the

The Wildlist website shows that worm numbers are increasing steadily rather than exponentially

internet on their own and as email attachments. Those caught in the wild have ranged from as little as 30 bytes in length to several megabytes, depending on their capabilities and intent. Their numbers are rising, but one anti-virus researcher says it's a mistake to think the problem is out of control.

"The number of new viruses is not increasing exponentially, as is often claimed," says IBM virus researcher David M Chess.

The Wildlist anti-virus website (www.wildlist.org) agrees: "The rate of appearance of new viruses in the collections of anti-virus workers has been increasing gradually for several years, at roughly a linear rate." Wildlist carries a monthly round-up of the worms and viruses known to be active. In September 2008, the total stood at 762, with 43 declared extinct over the previous months.

Despite their growing variety, all worms have several distinct parts in common. The basic elements can be thought of as the target locator, the infection propagator, an optional remote control and update handler, and finally the payload.

This main list includes viruses reported by multiple participants, which appear to be non-regional in nature. This list is "the" Wildlist according to original specification, which required viruses to be verified to-the-wild by a minimum of two participants.

After falling off, viruses sometimes reappear in The Wildlist. Such viruses are denoted with the symbol **.

* Viruses marked with a plus sign (+) are new to the main list this month.

Name of Virus	Size (bytes)	List Reported (Date by)
W32/Agent.1179824	2000	10/07/08
W32/Agent.1179825	2000	10/07/08
W32/Agent.1179826	2000	10/07/08
W32/Agent.1179827	2000	10/07/08
W32/Agent.1179828	2000	10/07/08
W32/Agent.1179829	2000	10/07/08
W32/Agent.1179830	2000	10/07/08
W32/Agent.1179831	2000	10/07/08
W32/Agent.1179832	2000	10/07/08
W32/Agent.1179833	2000	10/07/08
W32/Agent.1179834	2000	10/07/08
W32/Agent.1179835	2000	10/07/08
W32/Agent.1179836	2000	10/07/08
W32/Agent.1179837	2000	10/07/08
W32/Agent.1179838	2000	10/07/08
W32/Agent.1179839	2000	10/07/08
W32/Agent.1179840	2000	10/07/08
W32/Agent.1179841	2000	10/07/08
W32/Agent.1179842	2000	10/07/08
W32/Agent.1179843	2000	10/07/08
W32/Agent.1179844	2000	10/07/08
W32/Agent.1179845	2000	10/07/08
W32/Agent.1179846	2000	10/07/08
W32/Agent.1179847	2000	10/07/08
W32/Agent.1179848	2000	10/07/08
W32/Agent.1179849	2000	10/07/08
W32/Agent.1179850	2000	10/07/08
W32/Agent.1179851	2000	10/07/08
W32/Agent.1179852	2000	10/07/08
W32/Agent.1179853	2000	10/07/08
W32/Agent.1179854	2000	10/07/08
W32/Agent.1179855	2000	10/07/08
W32/Agent.1179856	2000	10/07/08
W32/Agent.1179857	2000	10/07/08
W32/Agent.1179858	2000	10/07/08
W32/Agent.1179859	2000	10/07/08
W32/Agent.1179860	2000	10/07/08
W32/Agent.1179861	2000	10/07/08
W32/Agent.1179862	2000	10/07/08
W32/Agent.1179863	2000	10/07/08
W32/Agent.1179864	2000	10/07/08
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W32/Agent.1179867	2000	10/07/08
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W32/Agent.1179869	2000	10/07/08
W32/Agent.1179870	2000	10/07/08
W32/Agent.1179871	2000	10/07/08
W32/Agent.1179872	2000	10/07/08
W32/Agent.1179873	2000	10/07/08
W32/Agent.1179874	2000	10/07/08
W32/Agent.1179875	2000	10/07/08
W32/Agent.1179876	2000	10/07/08
W32/Agent.1179877	2000	10/07/08
W32/Agent.1179878	2000	10/07/08
W32/Agent.1179879	2000	10/07/08
W32/Agent.1179880	2000	10/07/08
W32/Agent.1179881	2000	10/07/08
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W32/Agent.1179884	2000	10/07/08
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W32/Agent.1179897	2000	10/07/08
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W32/Agent.1179899	2000	10/07/08
W32/Agent.1179900	2000	10/07/08
W32/Agent.1179901	2000	10/07/08
W32/Agent.1179902	2000	10/07/08
W32/Agent.1179903	2000	10/07/08
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W32/Agent.1179995	2000	10/07/08
W32/Agent.1179996	2000	10/07/08
W32/Agent.1179997	2000	10/07/08
W32/Agent.1179998	2000	10/07/08
W32/Agent.1179999	2000	10/07/08
W32/Agent.1180000	2000	10/07/08

Depending on how virulent the worm is, the target locator could be designed to find targets in a number of ways. It may raid your address book and send emails to everyone you know with a copy of itself as an attachment. The famous Melissa worm of 1999 propagated itself this way, using a Windows API to read the address book, and emailing itself to the first 50 contacts.

'In theory, anti-virus programs should quickly make older worms and newer variants obsolete, but they don't'

Emailing is still a viable way for worms to spread today. Think about how many times you've not hesitated before opening an email attachment from a trusted friend, and you can see how quickly an epidemic can start.

To find new victims, the target locator might generate random IP addresses to test or even raid the DNS cache and its host's files. Whatever the method, once the worm locates a running target with the right operating system, the infection propagator can try to break in using unpatched security vulnerabilities that will allow it to inject the worm's code and set it running.

Depending on the nature of the worm, it may have software to handle remote control and to update its own code. This is a feature of 'botnet' worms, whose owners (called 'herders') need to keep their code updated to grow their botnets (networks of compromised computers that, without the knowledge of

their owners, relay malicious traffic on demand) and to stay one step ahead of both the law and other gangs. The great skill here is to create a command and control structure that is difficult to trace and distributed for resilience against attack, but very efficient at giving the botnet its orders to upgrade, spam, mount denial of service attacks, and so on.

Some worms are designed to propagate as widely as possible, but most have a more focused purpose. Carrying it out is the job of the payload. Some collect identities for later sale, but many are simply destructive. For example, the Witty worm, released in March 2004, deleted a section of each victim's hard disk as it spread rapidly, exploiting a vulnerability in several security products marketed by Internet Security Systems.

Perhaps even more frightening is that increasingly sophisticated worm-writing toolkits are now freely available for inexperienced hackers to roll their own. One such toolkit is TrojanToWorm, which can repackage a virus into a worm so that it can spread independently.

According to anti-virus company Panda (www.pandasecurity.com), TrojanToWorm is thought to have originated in Spain because the user interface can be switched between Spanish, Portuguese, Catalan and English. Its advanced point-and-click options include the ability to disable system features such as the Windows Task Manager and Registry editor, and even popular web browsers. It allows an infection date to be set and can even display a message on a victim's computer.

Releasing a worm

Worms unreleased are worms that may as well not exist. But the problem for the writers is that worms can be traced back to their source. Because there are heavy penalties for knowingly releasing a worm or virus, worm writers have come up with solutions that sometimes rely on psychological trickery as much as technology.

The Morris worm

When 23-year-old Cornell University doctoral student Robert Morris released his computer worm in November 1988, it changed the online security landscape for ever.

Released apparently as private research to gauge the size of the rapidly developing internet, Morris' worm spread quickly.

Among other methods, it used a security bug in the venerable Sendmail program used on some computers. It also attempted to crack passwords. But the worm itself had a bug, causing it to progressively slow and then freeze target computers by infecting them multiple times.

Morris, now an associate professor at



Robert Morris' release of a computer worm in 1988 changed the online security landscape for ever

Cornell University, was prosecuted and sentenced on appeal to three years' probation, 400 hours' community service, and a fine of \$10,000.

The number of systems infected was quoted as 6,000, and the damage between \$10m and \$100m. But in a footnote to an essay (www.paulgraham.com/submarine.html), programmer and venture capitalist Paul Graham says the figure was a guess: "I was there when it was cooked up and this was the recipe: someone guessed that there were about 60,000 computers attached to the internet, and that the worm might have infected 10 per cent of them."

Because the Morris worm simply injected running code, rebooting the infected machine cured the problem.

However, as Graham points out: "People like numbers. And so this one is now replicated all over the internet, like a little worm of its own."

It used to be possible to release worms and viruses from unattended internet terminals in internet cafes or provided free in public libraries and drop-in centres. The tightening up of the physical security of such facilities, and the installation of up-to-date security software, have rendered this release method largely ineffective, but there are plenty of others.

Worm writers can rent time on a botnet and release their work as an attachment to millions of spam emails. Botnet owners are security-conscious criminals and will presumably keep the worm writer's activities secret. Even if just one recipient clicks on the attachment, possibly in anger at believing they've been sent a bill for something they know they didn't buy, the worm will run and begin spreading.

A worm's releaser might crack the password for an abandoned email account and release the worm to the victim's contact list. A riskier tactic is to send the code anonymously to a hacker's forum, claiming to have caught and isolated it in the hope that someone else might release it and take the blame.

There's also the possibility of anonymously leaving the worm where it can be found by a so-called script kiddie – a teenager who hacks using other people's

exploits but doesn't necessarily understand how or why they work. Script kiddies may believe a suitably disguised worm is another free hacking tool.

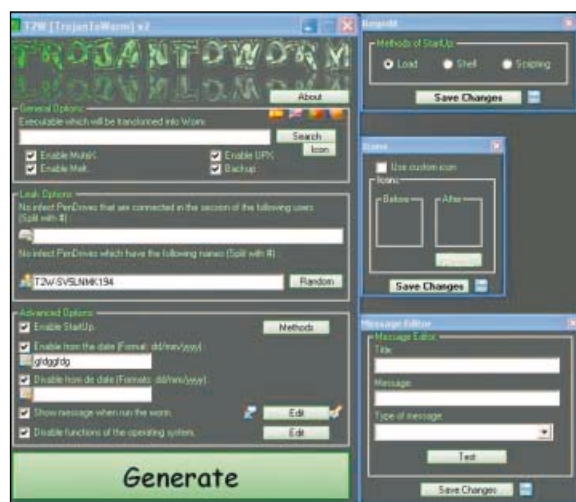
A related release method is to appeal to people's greed by crafting a media virus with the worm as its payload and sharing it on a peer-to-peer network. It only takes one person to download and view the media file and the release begins. Once the worm is in the wild, the situation can very quickly get out of hand as the infection spreads.

Propagation and detection

Worm writers are sometimes shocked by their progeny's speed of propagation and the world's equally shocked reaction. Within 24 hours, panic can set in as a writer realises that the media and police, backed by a global army of security researchers, are after them. What the writer may not realise is that in as little as 30 minutes after release, reports will have begun pouring into anti-virus labs as the infection takes hold.

A writer may not discover the full horror of what they've done until their handiwork hits the headlines. If the code is designed to phone home so its spread can be monitored, it might be around now that the writer realises it's also pointing the finger directly at its creator.

To capture and examine new worms, anti-virus companies use a honeypot system. On today's internet, unprotected machines can become infected within hours. Researchers take advantage of this in the same way that experienced hunters lure their



Tools such as VirusToWorm make worm writing worryingly easy

Just one user clicking on an email attachment containing a worm is enough to run that worm, which can then spread rapidly by attaching itself to emails the user sends

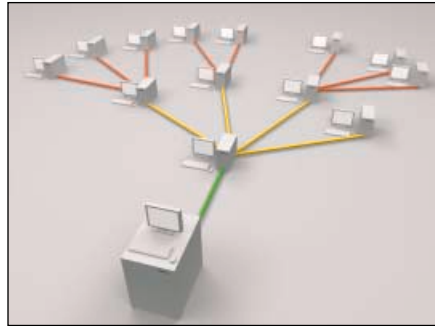
prey with tethered live bait. Some honeypots, called honeynets, consist of several machines pretending to be a network, but which exist only to be infected by worms or investigated by hackers.

When an attempted attack begins, the honeypot's software responds as if it really is being infected, but this is simply a beguiling illusion. In reality, it is gathering information about the attack to be replayed step by step in the lab.

From the data collected, the researchers can tell whether the worm's infection propagator is exploiting a new or existing vulnerability and spreading via unpatched systems. If it's a new vulnerability, then they can alert the developer, who can issue a patch. The researchers also create and issue an update to their anti-virus software to provide protection from the new worm.

Evolution

There's an arms race between worm writers and anti-virus researchers. One weapon used by some writers is to make their worms



polymorphic, automatically changing their code as they propagate while retaining their original function. They do this by encrypting most of the worm, leaving only the initial section unencrypted. This first part runs and decrypts the rest of the worm, but the decryption algorithm and associated key have to be hard-wired, and are therefore easily detected. So worm writers try to hide the unencrypted section by sprinkling it with random junk operations that do nothing or are deliberately skipped.

Some worms also create copies of themselves that encrypt using a different key to their parent. This makes detection more difficult, but anti-malware engines use sophisticated statistical techniques for assessing whether a program may be a

variant on a theme. The unencrypted main body of the worm still needs to perform certain tell-tale actions such as contacting random IP addresses despite the replication routines deliberately obscuring its meaning with junk instructions.

Good anti-virus products are available free, so why do old worms continue to cause so much damage?

On the trail

One way for writers to monitor how far their worms have spread is to program them to leave an instant message on an IRC or ICQ channel with each new infection, or to contact a temporary email account. However, whoever hosts the account also has the IP address of the person who accesses it, which makes trailing them through cyberspace an easy task for the authorities.

Vanity is the downfall of a few writers. They sign their work, placing their online nicknames in the running code for all to see. Because they use the same obscure handle as when they post to online forums, tracing them is simple.

However, some malware writers seem to set out to get caught. Blaster worm author Jeffrey Parson went so far as to provide a link to his website.

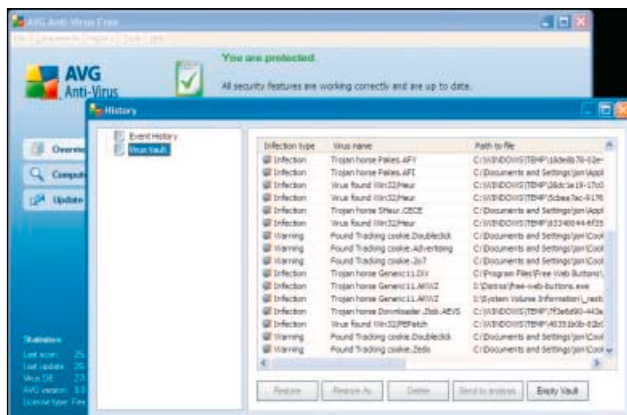
But the prize for sheer audacity must go to Michael Buen of the Philippines, who included a complete CV in his Love Bug virus of 2000. An infected machine would print this out, along with his contact details.

In time, other worm writers will catch and study a new worm. They might recode parts of it and release it as their own work, or change its payload. Sometimes the writer may share their work with a trusted few, who might in turn improve and release it. Back in 2004, *The Washington Times* reported that hackers were actively sharing code in this way to create a host of variations on the SoBig worm. With each incarnation, the payload became ever more destructive.

But not all copycat worm writers have access to the source code or the skill to disassemble it to inspect its workings. After the Anna Kournikova virus hit in 2002, for example, a rash of similar viruses appeared, but many simply failed to work and most were easily dealt with.

But some worms and their variants continue to cause trouble for many years. This gives rise to an important question: does malware ever become truly extinct, or does it simply evolve as more programmers take the original code and incorporate it into their own efforts?

While some worms are designed to die on a certain date, most aren't. In theory, anti-virus programs should quickly make older worms and newer variants obsolete, but they don't. So why does it take years for some infections to be eradicated – if they ever are? The answer is simple: despite a host of free security packages, some users just don't protect themselves adequately online. **PCW**



Good worms?

If it's so easy to create and release worms, does anyone make use of the techniques for benevolent purposes?

Milan Vojnovic and his colleagues at Microsoft Research in Cambridge are investigating ways to enhance the target-finding capabilities of official update worms carrying patches, so they can spread and protect Windows systems faster than malicious worms can infect them.

So-called helpful worms have been developed unofficially, too. The Welchia worm, for example, exploits the same vulnerability in the Windows XP remote procedure call service as the malicious

Blaster worm. Unlike Blaster, it tries to install security patches from Microsoft that stop subsequent Blaster infections.

However, Welchia also reboots the patched computer without the knowledge or consent of its owner. And it isn't alone.

In 2001, the Cheese worm began closing a well-known Linux security loophole. Later that year, researchers also discovered the Noped worm, which scanned the names of JPEG files on infected systems against a list of paedophilic images. If it found one, it randomly selected a child protection agency and emailed it with the machine's IP address.

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(CODE PC15)



SMALL IS BEAUTIFUL

Netbooks may be the flavour of the moment, but laptops and compact desktops are still some of the most popular types of PC – especially Apple's Macbooks, the latest incarnation of which we test this month, alongside the new version of Openoffice. Could it be as significant an open-source release as last year's Firefox 3?

Security is always an issue for PC owners, with new viruses and scams popping up – less than a day after the US election, scammers were using the result to lure people into malicious downloads. While the features of different security packages may be similar, their ease of use and performance can vary, and in our group test on page 95, we've put a dozen of the latest suites through their paces.

Another kind of security is the physical kind, and thanks to broadband, we can all indulge in the sort of CCTV monitoring that used to be the province of big stores and companies; our second group test this month looks at wireless security cameras, on page 80.

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OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.

Recommended: A product that combines great features, usability and value for money.

Great Value: Not the best in class, but a product that has superior features and performance for the price.

Best Buy: The best product in its class in terms of performance, features and value for money



REVIEWS



'This camera can't be beaten in terms of the area it lets you monitor and it also comes with a decent array of features'

Read the review on page 80

NOTEBOOK PC

Rock Pegasus 520-P8400

A powerful and weighty notebook



The Pegasus 520 has enough power to run most everyday apps

The latest addition to Rock's Pegasus family of notebooks is the 15.4in 520. Currently there are two models, the 520-T9400 (with Intel's Core 2 Duo T9400 processor) and our review sample, the 520-P8400. Both models are packed with features and ideal for both work and pleasure while on the move. Well, 'on the move' might be a bit misleading, as the device weighs a pretty hefty 3.75kg (including the power adapter), so you'll certainly know about it if you have to lug it around all day.

The Pegasus 520 follows the current trend for shiny black lids, this time set off by a matt-black chassis and keyboard, and a metallic silver chassis top. The notebook doesn't sit flat on a surface but instead has a support leg in each corner and strategically placed plastic lugs over the chassis bottom to help keep a cooling airflow passing through the internals. It works very well as there is barely a whisper when you boot up the device.

As you may have guessed from the name, the Pegasus 520-P8400 is powered by an Intel Core 2 Duo P8400 CPU, which is clocked at 2.26GHz, and has a 1,066MHz front-side bus (FSB) and 3MB of L2 cache. The CPU is backed up by 2GB of PC2-6400 800MHz DDR2 memory, giving the notebook enough power to run most everyday applications without missing a beat. The specification's power is confirmed by its PCmark05 score of 5,994, which puts it just in the top 10 of notebooks we have recently tested. It also scores a creditable 3,799 in the latest, more demanding PCmark Vantage benchmark.

At each end of the keyboard is a speaker, which although still tinny isn't as ear-piercing as the normal notebook offerings. The keyboard itself doesn't come

with a separate number pad, but the keybed feels well made without any flex, and the keys are responsive, making typing a pleasure. The trackpad is also responsive without being too sensitive and has vertical scrolling but not horizontal. Equally precise are the two mouse buttons under the trackpad, which are separated by a fingerprint reader.

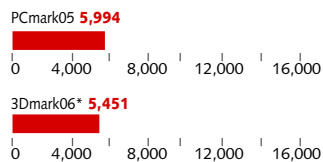
Driving the graphics is one of Nvidia's 9650M GT graphic cores. The 9650M GT is a DirectX 10 part with a 575MHz core engine and 1GB of dedicated GDDR2 memory. While the Pegasus 520 doesn't have the gaming performance of a dedicated gaming device (and Rock does produce a number of those) it can still give reasonable frame rates at lower resolutions and game detail settings. It also has Nvidia's Purevideo HD engine, which supports full 1080p – handy if you opt for the £145 Blu-ray drive, and there's an HDMI port built into the left-hand side of the chassis so you can connect to an external HD TV or monitor.

The 15.4in WSXGA screen has a native resolution of 1,680x1,050 pixels and offers clear text and good sharp colours. Although the glossy coating on the screen does reflect office lighting, it's by no means the worst we have seen. Built into the top bezel of the screen is a two-megapixel webcam, housed in a mounting that turns through 360°.

As standard, the Pegasus 520 comes with a 250GB hard drive but if this isn't enough storage space for you there are two 320GB hard drive options (with differing spin speeds). Battery life isn't bad for this class of system: when tested with the Mobilemark 2007 DVD playback test it managed to last for three hours and 45 minutes, which is just about enough to watch a Peter Jackson movie.

Simon Crisp

Performance



*Tested at 1,024x768 in 32-bit colour

Verdict

Pros Good blend of performance and features

Cons A little heavy and pricey

Overall A good all-round notebook offering plenty of performance to do all the everyday applications while still having some game-playing capability

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall ★★★★★

Price £999

Contact Rock Direct
www.rockdirect.com 0845 688 0501

Specifications Intel Core 2 Duo P8400 (2.26GHz) • 2GB PC2-6400 DDR2 Ram • 1GB Nvidia 9650M GT graphics • 250GB hard drive • 15.4in WSXGA display (1,680x1,050) • 802.11a/g/n Wifi • Bluetooth 2.0 • two-megapixel camera • four USB ports • 367x270x31mm (wxdxh) • three-year C&R parts and labour warranty

LAPTOP COMPUTER

Apple Macbook

Think of it as the Macbook Semi-Pro...



The Macbook has a new metallic design and improved 3D graphics

The new Macbook does not – as you might expect – replace the old one. There's an updated version of the original Macbook with the white case still on sale, with a 2.1GHz Intel Core 2 Duo processor, 1GB of Ram and 120GB hard disk for £719.

In contrast, the other new Macbook is a shiny, metallic number with the same aluminium casing as Apple's professional-level laptop, the Macbook Pro – albeit with a 13.3in display rather than the 15.4in display of the Pro model. You could, perhaps, think of it as the 'Macbook Semi-Pro'.

The metallic model is available in two versions, the cheapest of which costs £949 with a 2GHz Intel Core 2 Duo processor, 2GB of Ram and a 160GB hard disk. However, our review unit was the more powerful 2.4GHz model, which has a 250GB hard disk, and is priced at a fairly hefty £1,149.

The new look is an improvement. It will appeal to existing Macbook users who, according to Apple CEO Steve Jobs, have been 'lusting' after the metal look for years. However, the one other thing Macbook owners have been lusting after is a decent graphics chip.

To keep the price down, the original 'white' Macbook – including the £719 model still on sale – used the Intel X3100 graphics processor, an integrated graphics chip that couldn't handle the high-speed action of top-ranked computer games. Mind you, the number of A-list games released for the Mac in the past year can be counted on the fingers of one hand.

But, bowing to demand from customers, Apple has put a decent graphics processor inside the Macbook, in the form of Nvidia's new Geforce 9400M. Apple claims that, depending on which game you try to run, the 9400M is two to six times faster than the X3100 of

previous models. That's not much of a claim, as previous Macbook models could be brought to a halt even by games such as Guitar Hero, which is hardly state of the art these days. However, the improved graphics of the new Macbook do at least make it an option for the more casual gamer, and may swing a few undecided voters from the PC side of the fence.

There are a few smaller changes in the new models too. A backlit keyboard will illuminate the keys if you're in a dark room, such as a lecture theatre. And Apple has removed the button from the trackpad area, allowing it to increase the size of the trackpad. If you want to click on something you can just press down anywhere on the surface of the trackpad.

The old Firewire interface has gone too and the Macbook now relies solely on USB2 for expansion. However, it has gained an external video port so you can connect it to a larger monitor if you need to. Other features provided as standard include Ethernet, 802.11n wireless networking, Bluetooth, a webcam, stereo speakers and combined digital/analogue audio input and output. There's the usual bundled software too, with Apple's iLife suite providing video-editing, photo-management and DVD-burning software. Battery life is very respectable. We didn't get the five hours that Apple boasts, but we won't complain about the almost 4.5 hours that we did get.

The metal Macbook is certainly nice to look at – as you'd expect from Apple – and the improved graphics performance is welcome. However, a minimum price of £949 for what is meant to be an affordable home computer does seem steep. If you're not that bothered about playing games then the one remaining 'white' model arguably represents better value. *Cliff Joseph*

Verdict

Pros Attractive new design; significantly improved 3D performance

Cons Expensive; no more Firewire

Overall The metal Macbook is certainly an improvement over its predecessors, but the higher prices are disappointing

Features ★★★★★

Performance ★★★★★

Value for money ★★★☆☆

Overall ★★★★★

Price (as reviewed):
£1,149

Contact Apple 0800 048 0408
<http://store.apple.com/uk>

Specifications 13.3in LED display with 1,280x800 resolution • 2.4GHz Intel Core 2 Duo processor • 2GB Ram • 250GB hard disk • Nvidia Geforce 9400M graphics with 256MB shared memory • Two USB2 interfaces • Ethernet and 802.11n wireless networking • Bluetooth 2.1 • Built-in webcam • Digital audio input/output • Bundled iLife software suite

DESKTOP PC

HP Compaq dc7900

A compact desktop for business users



One of the many problems that small and large businesses face is a lack of space, particularly desktop space. HP has been addressing this need for some time with its 7000 range of small, compact PCs, one of the latest of which is the Compaq dc7900 (FU038ET).

Compact really is the name of the game with the dc7900: its footprint is just 251mm wide by 254mm deep, so it can fit in some very small spaces. It is also whisper-quiet, with an external notebook-style power brick and just two small 7cm case cooling fans. Both

the CPU and Northbridge chipset are passively cooled, which adds to the overall quietness.

The dc7900 uses some rarely seen Intel technology: namely, Intel's dual-core E5200 processor and Q45 Express chipset. The E5200 is clocked at 2.5GHz and has an 800MHz front-side bus (FSB) but, more importantly in a small PC, it has a thermal design power of just 65W.

As standard the dc7900 comes with 1GB of PC2-6400 800MHz DDR2 memory; notebook memory is used to suit the PC's compact design. If you want to add more memory, the motherboard supports up to 8GB through two Sodimm slots.

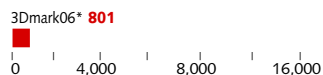
Permanent storage is provided in the shape of an 80GB 7,200rpm Seagate 2.5in hard disk, and there is also a built-in slimline eight-speed SATA DVD-Rom drive, although it seems rather odd that HP didn't opt for a DVD burner.

There's no shortage of USB ports on the dc7900, with two on the front panel and six on the rear, along with the surprising addition of a Displayport.

As with all HP business systems, the Compaq dc7900 comes with a range of useful software utilities preloaded, including HP's Backup & Recovery and Protect Tools suites.

Simon Crisp

Performance



*Tested at 1,024x768 in 32-bit colour

Verdict

Pros Small format; practically silent

Cons No DVD burner

Overall The dc7900 offers a tidy solution for a small office

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £515

Contact HP UK www.hp.co.uk

Specifications Intel Dual Core E5200 2.5GHz • 1GB PC2-6400 DDR2 • Integrated Intel GMA4500 graphics • 80GB drive • Gigabit Ethernet • Eight USB ports • 251x254x66mm (wxdxh)

GRAPHICS CARD

Sapphire Radeon HD4850 X2

A dual-processor graphics card that won't break the bank



At the time of writing, Sapphire's Radeon HD4850 X2 is the first and only example of the dual-GPU version of AMD's mainstream HD4850 graphics card.

The HD4850 X2's two RV770 cores are connected internally by a Crossfire bridge and each has 1GB of GDDR3 memory (a dual-512MB model will be launched shortly) clocked at 993MHz (in effect, 1,986MHz with two processors) running via a 256-bit interface. Core and shader clock speeds are the same

as the single-cored version: 625MHz for both. Just like its bigger brother, the HD4870 X2, it's a big card that needs a fair amount of power and, to that end, it comes with eight-pin and six-pin power connectors.

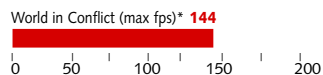
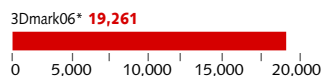
Unlike the HD4870 X2, the HD4850 X2 uses two cooling fans in a double-height cooler, which keeps the card very cool. However, the review device was a very early board with drivers that didn't have any fan control built in, so the fans were spinning at high speed all the time, making it noisy; retail boards should have this problem ironed out. On the back of the card there is a passive heatsink to keep the power regulators cool.

While the Radeon HD4850 X2 may be aimed at gamers, one of its features will appeal to workstation users: the four dual-link DVI ports on the expansion panel, allowing for multi-monitor setups. While all four outputs are HDCP-compliant and can be used with an HDMI adapter, only two of the four will support audio output, including native 7.1 surround sound.

HDMI, VGA and Crossfire adapters are included, with both six-pin and eight-pin PCI-E-to-Molex power connectors – handy if your power supply isn't a current one. The software bundle includes Futuremark's 3Dmark06 benchmarking tool.

Simon Crisp

Performance



*Tested at 1,024x768 in 32-bit colour

Verdict

Pros Great performance; support for four monitors

Cons Fan noise on review card

Overall A good alternative to the HD4870 X2

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £317.25

Contact Ebayer.com

www.ebuyer.com 0871 521 3300

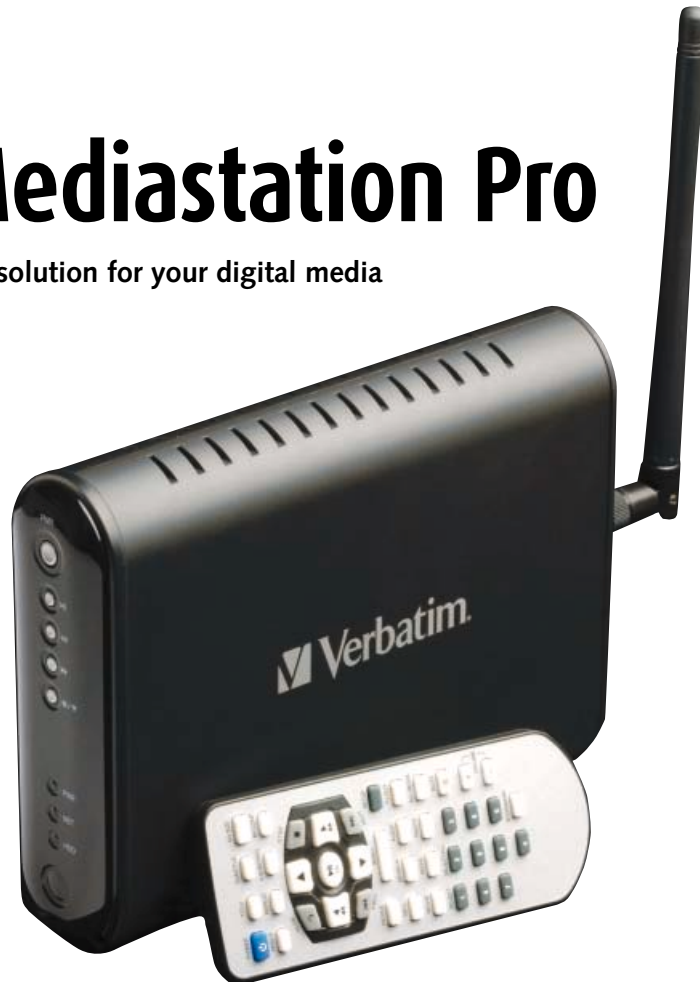
Specifications Two AMD/ATI RV770 graphics cores • 2x 1GB GDDR3 VRam

MEDIA STREAMER

Verbatim Mediastation Pro

A network streaming and storage solution for your digital media

The Mediastation's interface is a bit basic, but it performs well and can browse and access files quickly



If you're in the market for a digital media streamer that can store content locally, then Verbatim's Mediastation Pro may be ideal. It comes with a 500GB hard drive pre-installed, supports a range of formats, including AVI, MP4, MPG and WMV, though the H.264 codec is not supported. There is also an HDMI connection for hooking it up to HD-ready TV.

Using this you'll be able to stream and view video up to 1080p resolution and, if you don't want to lug the thing to another room every time you want to copy files across, you can connect external USB storage directly to one of the ports on the back.

Setting it up and viewing content that's stored locally is as simple as connecting an AV cable and firing it up. You'll then be able to select the internal drive and filter by audio/video/photos, or view the whole lot at once. We can't imagine why anyone would choose the former, as this feature is a simple file-type filter that removes unnecessary formats. So, provided you keep things organised into folders, it isn't really necessary.

If you want to browse and play back files across a network, you'll need to search and connect using the tools in the setup menu to allow access. To view folders on your PC, you simply share them using Windows' default tools, which, while basic, is quite an effective approach, since it allows you to retain the folder structure to keep things organised.

We were impressed with the performance of the Mediastation, both in terms of how quickly it can browse and access files, and in the video quality on an HDTV. We tested some high-definition content over the wireless connection and only noticed it starting to struggle when entering 1080p territory. And though

files can sometimes take a little while to load, it's a pretty effective way to handle the latest formats. There's also a decent amount of control here, including subtitle customisation and support, aspect ratio adjustment and search and browse features. Unfortunately, this doesn't follow through to music and photo playback, which offer very little beyond simple browsing and a range of repeat functions.

In addition to media playback, you'll also find access to a limited range of internet radio stations, the ability to copy files from FTP servers, password protection and a skinnable interface.

Despite these advantages, Mediastation Pro is a little uninspiring since the interface itself is basic. Most of the time you're simply shown a list view through which to choose content to play back, and though there are some basic playlist features that allow you to combine videos, photos and music, it doesn't feel as though you have decent control over your media.

The supplied remote control can be rather awkward to use since it packs in far too many context-sensitive controls, many of which you'll never use, and it's almost impossible to work out what you're doing without squinting down at it to find the right button. The Mediastation can also be a little unstable – it crashed more than once during testing, resulting in having to pull the plug and restart to regain control.

While Verbatim's effort performs quite well, it does come across as rather basic and doesn't offer anything that's likely to redefine the market. If you're looking for a straightforward solution and can cope with occasionally awkward controls, then it should suit, but unless you make good use of the internal storage there are better options available elsewhere. *Paul Lester*

Verdict

Pros Impressive performance; 1080p playback over HDMI; straightforward setup

Cons Overly basic interface; limited features and media control; lack of extras; no H.264 support

Overall Despite its faults, the Mediastation Pro is still a capable solution if you're looking to store media locally. It performs well over a network and is easy to set up and use

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £210

Contact www.verbatim-europe.co.uk

Specifications 500GB • 802.11g (54Mbps/sec) 802.11b (11Mbps/sec) wireless, 10/100Mbps/sec wired • HDMI, component video, S-video, composite video, stereo audio, digital audio optical, digital audio co-axial • video format support: MPEG-1/2/4, MP4, DivX 3/4/5/6 (AVI), HD-MPEG-2, SD-MPEG-2, Xvid, WMV9 (WMV), TS/TP/TRP, ISO, IFO, VOB • MP3, WMA, WAV, Ogg Vorbis, AAC • JPG, JPEG, PNG, BMP • 48x150x210mm • 1,150g

COMPACT CAMCORDER

Kodak Zi6

Pocket-size camcorder that shoots 720p high-definition video



The pocket-size Flip camcorder was one of the top-selling gadgets this summer and has inspired a slew of imitators, including Kodak's Zi6. At £129.99, the Zi6 is about £30 more expensive than the Flip, but justifies that price by capturing high-definition video in 720p format (1,280x720 resolution), which is much sharper and clearer than the 640x480 resolution of the Flip.

You've also got a choice of several shooting modes. The standard high-definition mode shoots at 30 frames per second (fps), or you can go for 60fps for smooth slow-motion playback. It's a nice touch and will come in handy for those 'you've been framed' moments.

You can drop down to 640x480 resolution if you want, or shoot stills at three-megapixel resolution. The 2.4in LCD screen is bright and clear, and it's easy to hold the camcorder in one hand and quickly frame your shots. The Zi6 is quite solidly built and will survive the occasional knock while tucked away in your pocket.

Video is captured in H.264 format, so you can easily transfer your videos to an iPod or upload them to Youtube. The preinstalled Media Impression software offers simple editing tools, as well as an option for uploading files directly to Youtube. Media Impression only runs on PCs, but Macs can still handle H.264 and use Apple's iMovie for video editing and internet sharing.

The only minor disappointment is the paltry 128MB of internal Ram (the Flip has 2GB), which barely holds a couple of minutes of high-definition video: you'll need to buy an SD memory card. Even so, the Zi6's compact design and high-definition video make it an excellent choice for shooting high-quality video clips without fuss when out and about.

Cliff Joseph

Verdict

Pros Compact but solid design; good video quality; easy to use

Cons Limited internal memory; requires purchase of additional SD memory card

Overall With HD video quality and attractive 2.4in display, the Zi6 is one of the best of the current crop of pocket camcorders

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £129.99

Contact Kodak 0870 243 0270

www.kodak.com

Specifications 11.4x6.4x2.3cm (hwxwd) • 130g • Resolution 640x480 to 1,280x720 • 2x zoom • 2.4in LCD display • macro mode • USB2 interface • 2xAA rechargeable batteries (supplied) • Media Impression software bundled

COMPACT CAMERA

Samsung L310W

The new flagship model in Samsung's L series brings with it a wide range of features



The L310W is the only camera in Samsung's point-and-shoot range with a wide-angle lens. With a 35mm equivalent zoom range of 28-102mm, it's great for group shots or interiors where you can't put a lot of distance between yourself and your subject.

It also comes with a 13.6-megapixel sensor. While this is almost certainly too high for a camera of this size, it gives you some bragging rights as it's one of the highest pixel resolutions currently available.

The L310W is crammed with useful features: face

detection for up to nine faces, dual optical and digital image stabilisation and high ISO modes all help you get the best pictures with minimal effort in a wide variety of shooting situations. Processing features include smile and blink detection, as well as a Beauty Shot mode that automatically enhances skin tones.

We found the L310W took some sharp, high-quality shots at ISO 80 and effective noise reduction kept shots usable even at the highest sensitivity modes, despite the inevitable loss of detail.

Samsung has built a photo help guide directly into the camera interface. This gives step-by-step instructions with diagrams to help overcome common problems such as camera shake or poor focus. Unfortunately, it's not immediately obvious what each of the camera's tiny silver control buttons does, and their legends are very difficult to read. If you do more than just put the camera in full auto mode, you'll need a little time with the user manual.

We also found that after turning on the L310W, the built-in flash needed several seconds to charge up, and the camera was a little sluggish in operation generally.

Overall, Samsung's L310W is a point-and-shoot camera that does it all for you, occasionally with very good results.

Paul Monckton

Verdict

Pros Packed with features; face detection; dual image stabilisation

Cons Slow to start up; slow autofocus; control buttons difficult to read; no shutter or aperture priority modes

Overall Good-looking ultra-compact with a wide range of features and good image quality

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £199

Contact Samsung

www.samsungcamera.co.uk

Specifications 1/1.72in CCD with 13.6-megapixels; 2.7in LCD with 230,000 pixels • 28-102mm F/2.8-F5.7 zoom lens • 5cm macro • shutter speeds 8-1/1,500sec • 30MB internal memory • Video recording at 800x592 pixels at 20fps; 640x480 at 30fps • 92x23x61mm (wxdxh) • 138g

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- No adapters needed
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- **PC Utilities wrote:** 'This comes highly recommended'
- **Computer Shopper wrote:** 'It's a wise investment'
- **Business Pro wrote:** 'Compatible with virtually every kind of memory cards'

Sandberg USB ChatSet



- Connects to USB
- Connect your speaker set and the ChatSet simultaneously
- Clear sound reproduction perfect for online telephony
- Inline volume control

125-61 R.R.P. **£19.99**

- **Mac or PC wrote:** 'Once you've got it you'll wonder how you did without!'
- **USB Core wrote:** 'Simplify life for users of VoIP applications'
- **Hexus wrote:** 'Pure sound and a good microphone'

Sandberg Wireless Keyboard Set



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MONO LASER PRINTER

Brother HL-2035

An excellent, no-nonsense entry-level mono laser printer



Brother's HL-2035 is very easy to set up. It's small and light, so you won't need any help unpacking it and, if you follow the animated instructions on the supplied CD-Rom, you'll have no problems at all getting it going. All you have to do is remove the packaging and strips of securing sticky tape, then load the toner unit into a slot at the front.

All access to paper and consumables is from the front of the HL-2035, so you can place it wherever you like, even close to a wall. Up to 250 A4 pages can be loaded into its fully covered main paper tray.

The printer driver software is simple and clearly laid out yet covers all the main functions, including N-up (multiple document pages printed on one sheet), booklet printing, watermarks and manual duplex.

The HL-2035 lacks an LCD readout and illuminates various combinations of four LEDs to communicate its status. A small interactive help application explains what each combination means and how to rectify problems. Linux users are also well catered for.

Budget printers often incur much higher running costs than their more expensive counterparts, but this is not the case with the HL-2035: each page costs approximately 2p to print. However, you should expect the printer to last for around 12,000 pages only, because at this point the drum unit must be replaced – and that will cost around £10 more than a new printer. Factoring in the cost of a new printer raises the per page cost to 3p.

In our performance tests, the HL-2035 consistently managed to hit its claimed print speed of 18 pages per minute when printing a variety of content. And with a time of around 10 seconds before the first page in a print job appears, this printer is fast enough for single users or even for sharing over a small network. It also carries a one-year on-site warranty. *Paul Monckton*

Verdict

Pros Compact design; fully covered paper tray; easy setup; front-loading; price; Linux compatibility

Cons No LCD readout; no network connections

Overall A basic, yet well-constructed printer that's easy to set up and use

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £58.74 inc Vat

Contact Brother www.brother.co.uk

Specifications 2,400x600dpi print resolution • 18ppm • Full-speed USB2 connection • 250-sheet paper tray capacity • single-sheet feeder • 100-sheet output tray • 60-150gsm paper handling • Envelope printing • GDI printing • 8MB Ram • Windows, Mac and Linux • 371x361x166mm (wxdxh) • 6.5kg • One-year on-site warranty

COLOUR LASER PRINTER

Dell 2130cn

An affordable colour laser with network support



Colour laser printers used to be a viable option for larger businesses only, as the price was always seen as prohibitive, but not any more. Prices have tumbled so far that Dell's latest colour printer, the 2130cn, is easily within reach of the small office, offering fast print speeds, good print quality and features normally found on more expensive models.

The 2130cn has a 400MHz engine with 256MB of memory (expandable to 1,280MB), with claimed print speeds of up to 20ppm for mono and 16ppm for

colour, although our tests gave a consistent 16ppm for mono and mixed pages at the default normal setting, and just 4ppm when printing a full A4 colour photo, again with the default settings. The maximum monthly duty cycle is 40,000 pages.

Print resolution is 600dpi and quality is good, with sharp, crisp text. Photographic content is fairly well dealt with, with skins particularly well reproduced.

The four standard toner cartridges (black, cyan, yellow and magenta) are good for around 1,000 pages depending on usage, and cost £25 (£29.38 inc Vat) for black and £36 (£42.30 inc Vat) for each colour cartridge. Larger capacity cartridges are available and cost £34 (£39.95 inc Vat) for black and £44 (£51.70 inc Vat) for the colour units and last for 2,500 pages (depending on usage). Replacing the cartridges is a straightforward job, as they all sit neatly behind a panel in the side of the printer.

As standard the 2130cn comes with a 250-sheet input drawer but can handle up to 500 sheets if you add another 250-sheet drawer. Maximum output capacity is 150 sheets.

The review model came with the optional duplex unit (£128), but both USB2 and 10/100 networking interfaces are supplied as standard. *Simon Crisp*

Verdict

Pros Good-quality print; networking included

Cons A little bulky

Overall A very good colour laser printer for the small office and maybe even the home if you have space

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £397.15 (as reviewed)

Contact Dell 0844 444 4699 www.dell.co.uk

Specifications 400MHz processor • 256MB memory • 600dpi print resolution • 20ppm mono • 16ppm colour • USB2 and Ethernet ports • 250-sheet paper input tray • 150-sheet output tray • Optional duplexer

22IN WIDESCREEN MONITOR

Viewsonic VLED221wm

This LED-backlit display delivers colours way beyond the scope of traditional screens



Viewsonic's new display uses a standard TN panel but, combined with an LED backlight, gives a much larger colour gamut than a standard monitor. As a result, it can display redder reds, greener greens and bluer blues than any monitor you're likely to have used before.

Our tests confirmed the VLED221wm's huge colour range: it's much closer to Adobe RGB than the standard sRGB, so photographers will be able to view images close to how their cameras intended.

As with all wide-gamut displays, the same caveat applies: using it without proper colour management can result in horrendous-looking images with massively over-saturated colours. If you plan to use this device with colour-critical programs such as photo editing, a hardware calibrator is a must.

Despite the enhanced backlight, the display still suffers from all the usual problems associated with TN panels. So while graphics professionals will love the colour range, they won't be so happy with the restricted viewing angles and unpredictable colour response.

Viewsonic claims the LED backlight will reduce power consumption, but the company's own figures rate the VLED221wm at 36W – only 2W less than the company's VX2262wm, which is a brighter display.

Except for the new backlight technology, this is a fairly basic monitor, albeit with a high build quality, thin bezel and high-gloss finish. It also comes with Viewsonic's usual enhancements, such as a very high 12,000:1 dynamic contrast ratio, built-in stereo speakers, dual inputs and cable management.

The VLED221wm is a curious monitor that is neither a fully fledged graphics display nor an ideal home entertainment screen. But it does bring very wide-gamut colour at a more affordable price. *Paul Monckton*

Verdict

Pros Ultra-wide colour gamut; dual inputs; stereo speakers

Cons TN panel; price; ultra-wide colour gamut

Overall A massively colourful display capable of stunning images in the right hands, but colour calibration essential

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £290

Contact Viewsonic
www.viewsonic.com

Specifications 22in TN panel with 16:10 aspect ratio • 1,680x1,050 resolution • 250cd/m² brightness • Contrast ratio 1,000:1 static, 12,000:1 dynamic • Viewing angles 160°/160° V/H @ CR>10:1, 170/170 @ CR>5:1 • Tilt-adjustable stand • VGA, DVI-D, 3.5mm stereo inputs • HDCP support • 2x2.5W speakers • Vesa 100 mount • 524x244x482mm (wxdxh) • 6kg

WIRELESS ROUTER

D-Link DIR-855

A dual-band wireless router



When you can buy a router for around £30, what will you get by spending five times as much on a product such as D-Link's DIR-855? The answer is just about every feature you've ever heard of, and then some. The DIR-855 isn't an ADSL modem/router; it's designed mainly for cable internet users and if your connection is via ADSL, you'll still need a modem with a network output.

A large screen on the top of the DIR-855 replaces the usual blinking lights. With a few button clicks you

can check whether the internet connection is working, whether wireless security is enabled, and more.

The DIR-855 is two routers in one: it has two radio units, one for each of the 802.11n frequencies. The one at 2.4GHz is used by most current equipment, while the 5GHz radio is designed for streaming media files to suitable devices. You can surf the web using one band without affecting the speed of the other. You can even create a separate guest wireless network that gives access to the internet but not your other computers. All five wired network ports are of the gigabit Ethernet variety.

Setup is straightforward for technically minded users, but intimidating for those new to wireless. The options are logically arranged, but there are a lot of them and, although there are some helpful wizards, they aren't immediately presented to the user.

We'd recommend avoiding updating the firmware unless the standard version doesn't work with your kit. Updating to the latest version crashed our wireless network until we reverted to the older software.

All in all, the DIR-855 is an impressive router but one we'd only recommend to users who need a dual-band router with all the frills. For internet sharing alone, spend far less on a simpler product. *Tom Royal*

Verdict

Pros Dual band; includes every conceivable feature; handy built-in display

Cons High price

Overall Does almost everything you could possibly want, but at a cost

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £170

Contact D-Link www.dlink.co.uk
Specifications 802.11n • 2.4 and 5GHz wireless router • 5Gbits/sec Lan ports • Built-in SPI firewall • Content filtering • USB2 port for Windows Connect Now • WPA2 encryption • 11.7x19.3x3cm (wxdxh) • 317g

PORTABLE PRINTER

Planon Printstik PS950

Print on the move from your mobile phone or PDA



As the devices we use to read emails and web pages become smaller and more portable, so more of us feel the need to have a portable printer too. This is the need that the Planon Printstik is designed to meet.

The Printstik is 300mm long and weighs just over 500g, so it can be carried around in your pocket or in a notebook computer bag. It lets people print documents such as web pages, bank statements, show tickets and brochures.

It connects to a notebook or handheld device via a Bluetooth connection. Those with an iPhone and its crippled Bluetooth can also use the supplied USB connector. Once the devices are connected, you just choose the print option on your mobile device.

The Printstik uses a thermal paper roll to cut down on bulk. One roll will supply the equivalent of up to 20 A4 sheets before it has to be replaced. You can just print out what you need and tear the paper off without using a

whole A4 sheet each time, although prints are always 8.5in wide.

Printing is in black and white and there are three different print modes: draft (200x100dpi), normal (200x200dpi) and best (200x400dpi). Print speeds range from two pages per minute in best mode, to three pages per minute in normal mode, and four pages per minute in draft.

But even on the best output setting, images are not fantastic. The type and pictures are grainy, and the thin paper gives the look of a cheap student newspaper or a bad-quality receipt. In draft mode, things get worse with type becoming blurry and nearly illegible, especially with web pages such as Streetmap.

Tearing off the paper is also problematic. The Printstik comes with a cutting tool, which in theory means you can just tear off what you have printed.

However, it's not sharp enough, so torn-off sheets are often ripped.

Andrea-Marie Vassou

Verdict

Pros Light and portable; connects to most devices

Cons Hard to tear paper off; printing is blurred; price

Overall The Printstik begins to bridge the gap between portable devices and printing but poor-quality printing lets it down

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £199

Contact Planon www.planon.com

Specifications 300x25x38mm (wxdxh) • 513g • A4 paper roll • internal rechargeable battery

FILM SCANNER

Veho USB Film Scanner

Create digital copies of your favourite photos from film



Most modern photo printers come with attachments to process negatives and slides, but if you don't own one of these you could use a dedicated solution like Veho's USB Film Scanner.

It's a pretty compact device that lets you turn slides full of negatives or 'positives' into digital images using the Arcsoft Photo Impression software provided. Film fits securely into one of two slide holders and must be fed through the scanner manually. An image preview

lets you judge when a picture is in position; when it is, you just press a button on top of the device or hit the on-screen 'capture' button to save it.

There is a choice of quality settings and the option of JPG or TIF file formats. The scanner can save images at the equivalent of five-megapixel resolution, or 2,592x1,680 pixels in size.

We were very impressed by the scanner's speed and ease of use, but not so much by the results. While very sharp and clear, colours seemed a little muted and if you don't take time to make sure the film is clean from dust and other particles, you'll notice artefacts across the image, which makes for more work during the editing process.

Speaking of which, there is a decent collection of tools available to correct things like red-eye or colour levels, to crop and straighten images, and to retouch them using clone tools and the 'healing brush'. When scanning images from film it's inevitable that you'll spend some time tidying things up, so it's nice to have the tools supplied with the package.

While not perfect, the Veho USB Film Scanner will make short work of your collection of old pictures. If you're prepared to spend a bit of time editing photos, you can achieve some impressive results.

Paul Lester

Verdict

Pros Fast and easy to use; editing tools provided; clear, high-resolution images

Cons Colour reproduction not up to scratch; photos still require a fair bit of editing

Overall If you're happy to spend a bit of time editing your photos, this is a fast and easy way to make digital copies of negatives

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £79.95

Contact www.firebox.com

Specifications 5-megapixel scanning • 2,592x1,680 max resolution • Automatic exposure/colour balance • USB2 • Negative and positive slide holders • 165x100x90mm (hwxwd)

PC Essentials

Our pick of the latest components and accessories

Choiix Ergonomic Metal Sleeve

Price: £24.99

www.scan.co.uk

Overall: ★★★★★

Choiix's Metal Sleeve combines a notebook sleeve/carrier with a notebook cooler. One side of the carrier has a fabric finish that comes in a variety of colours, while the other side has a large aluminium plate fixed to it. As a bonus, when you sit your notebook on the plate, it is pitched at a comfortable angle to type on.



Freecom Mobile DVD RW LS Pro

Price: £67.99

http://svp.co.uk

Overall: ★★★★★

Freecom's latest external DVD burner is a stylish slimline unit measuring 144x140x17mm and weighing a mere 0.75kg, including all the cables and power adapter. It can burn dual-layer DVD discs at four-speed and DVD-RW at eight-speed, supports Lightscribe technology and has two Firewire 400 ports and a single USB port.



Compro Videomate

Vista E900F

Price: £86.72

www.yoyotech.co.uk

Overall: ★★★★★

Compro's Videomate Vista E900F is a well-featured PCI Express TV tuner that comes with a host of features usually found on much more expensive cards. It offers dual DB-T and analogue TV functionality, hardware MPEG-1/2/4 encoding and noise reduction, and support for 1080i broadcasts. It also comes with Compro's own software and a Microsoft-certified remote.



Akasa AK-CB002 PWM

Price: £3.51

www.overclockers.co.uk

Overall: ★★★★★

Cheap, cheerful and very useful if you have a case full of fans. Akasa's PWM splitter cable takes the stress away from a PWM-supporting motherboard by using just one header to connect to the board while taking power direct from the power supply, synchronising up to three fans with CPU usage.

Intel X-25M SSDSA2MH080G1C5**Price: £466.91****www.lambda-tek.com****Overall: ★★★★★**

Want the fastest hard drive readily available on the planet? Got extremely deep pockets? If the answer to both these questions is yes, then Intel's 80GB X-25M SSD is the drive for you. Yes, that's right, an 80GB hard drive for a little less than £500. The X-25M is built around Intel's super-fast Multi Level Cell Nand flash technology.

**Antec Veris Multimedia Station E-Z****Price: £19.87****www.ebuyer.com****Overall: ★★★★★**

At the bottom end of Antec Veris's newly launched line-up of multimedia controllers is the Multimedia Station E-Z, a neatly designed unit that can be used with a notebook or a desktop to control all your multimedia remotely via a compact IR remote control and USB interface.

**Scythe Kaze-Jyu 100mm****Price: £6.49****www.quietpc.com****Overall: ★★★★★**

Scythe has a range of interesting cooling products with equally interesting names. The Kaze-Jyu 100mm case fan is ideal where you have a 92mm fan that's not giving enough cooling. Instead of taking a hole cutter to your case to fit a larger fan, try fitting this instead.

Western Digital Caviar Green**1TB WD10EADS****Price: £99.37****www.scan.co.uk****Overall: ★★★★★**

Western Digital has added another drive to its range of eco-friendly Caviar Green drives – the 1TB WD10EADS. The drive uses three platters to reach its 1TB capacity and has a 32MB cache. If you want to save a bit of money then there's a 16MB cache version, the WD10EACS, available for around £90.





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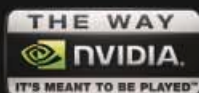
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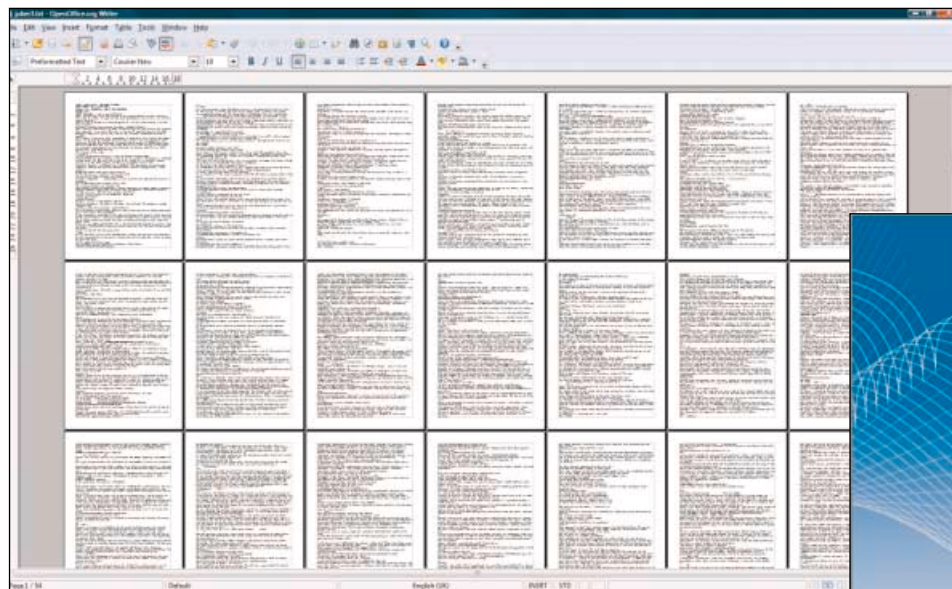
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OFFICE SOFTWARE SUITE

Openoffice.org 3.0

Latest version of free office suite gives Microsoft plenty to worry about



Multiple pages in Writer – note the similarity with Word 2003

New welcome screen offering a choice of modules



Openoffice.org has already done you a great favour, even if you don't use it. As a half-way credible alternative to Microsoft Office, it has forced down prices of that formidable suite, saving millions in usage fees paid by government organisations out of your taxes.

This latest version, Openoffice.org 3.0 (the org is included because of a brand conflict), makes it a more attractive option. It reads the new XML-based Microsoft Office formats, as well as reading and writing the old binary ones; some analysts even believe that its native ODF 1.2 formats will become dominant. And its support for PDF export, a feature only recently available from Microsoft as a Word add-on, has been enhanced, with a lot more user controls too.

Openoffice.org 3.0 lacks some Microsoft features and with software this complex you cannot guarantee that support for the rest will be absolute in every detail; but the same is also true of Microsoft Office 2007 compared with its predecessors. The suite had no problem with the straightforward Word, Powerpoint and Excel documents that we threw at it; conversely, Microsoft Office happily opened documents saved in its formats by Openoffice.org 3.0. The suite even looks like Microsoft Office 2003; to many people, it will seem more familiar than the new be-ribboned Office 2007.

There are six modules: the Writer word processor, Calc spreadsheet, Base database, Draw graphics editor, Math equation editor and Impress for presentations. A review this size cannot encompass all the functionality (in itself a measure of the package's value), so we will just point up some of the new features.

If you click on the program icon, you now get a welcome screen with a choice of colourful icons to

access the modules. Writer, while not offering as many view options as Word, now has a two-page editing mode and a zoom slider that not only enlarges your view but will also put multiple pages on-screen, which is especially useful if you have two monitors.

Writer saves in ODF format by default, which can bewilder users whose Word-using friends can't open emailed ODF files. A one-time pop-up box explaining this would save a lot of trouble, but probably discourage the use of ODF. You can, of course, change the default to a Microsoft format.

Calc now supports 1,024 columns, up from 256, and has a solver optimisation module, while Impress now lets you add and edit tables within presentations.

But there are some rough edges. We could not get Draw's supposedly revamped Crop function to work consistently. Far more worryingly, Writer crashed as this review was being finished; it did save the work but did not pull it back on re-opening. We found the backup via a Paths list buried in the Options menu. The help system in this and several other instances proved less than helpful.

This is a pity because Openoffice.org 3.0 has a lot to offer. Uniquely for an office suite, it runs natively on Linux, Windows, publisher Sun's own Solaris, and Mac OSX (previously on the Mac you had to run it sluggishly under X11 windowing). This makes it attractive for organisations using a variety of hardware.

No-one making extensive use of advanced Microsoft features is going to switch to Openoffice.org 3.0. But it is an option for departments and small firms doing the kind of office tasks that most people do most of the time; the same goes for households with more computers than Microsoft Office licences. *Clive Akass*

Verdict

Pros It's free; it's good

Cons Word processor's crash was less worrying than the fact that the backup was not easily found

Overall The best software bargain around, but save your work often until the auto backup is streamlined

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price Free

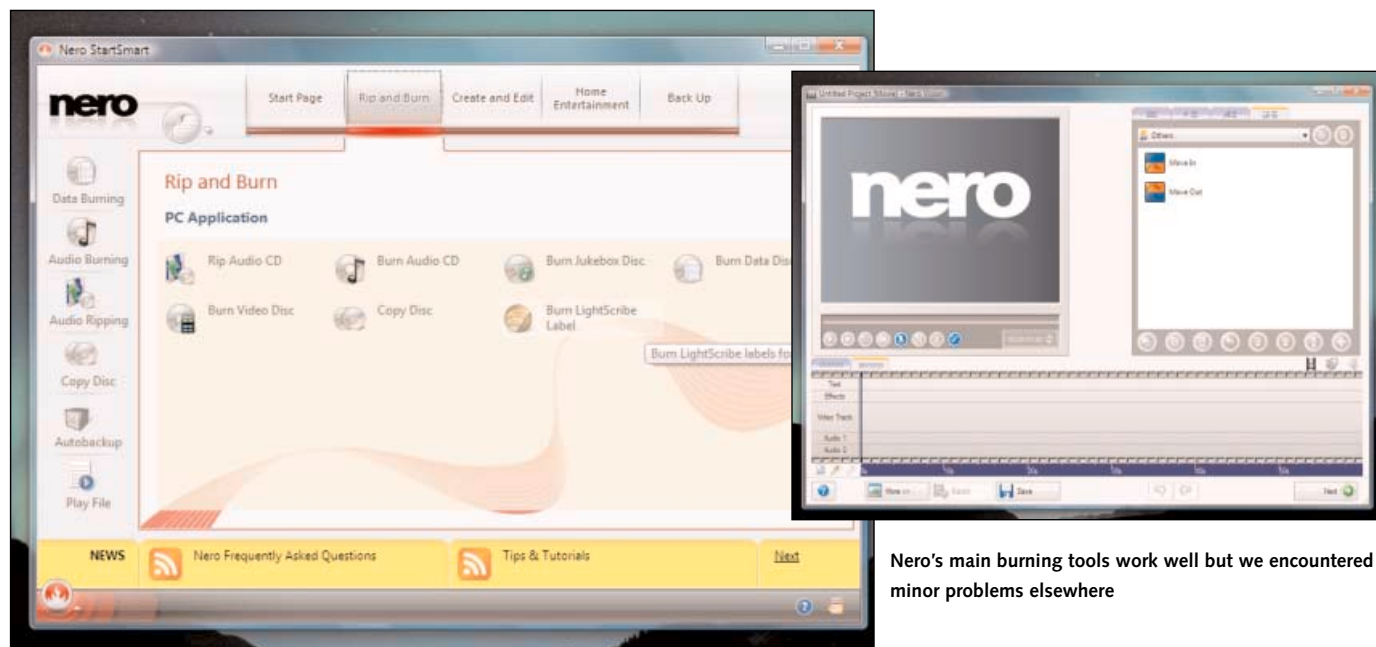
Contact Openoffice.org
www.openoffice.org

System requirements Windows XP or Vista, Linux (RPM and Deb) • Mac OSX, Solaris (x86, Sparc) • 256MB Ram • 650MB of hard disk (400MB after installation files are removed)

CD BURNING SOFTWARE

Nero 9

Some handy new tools, but not a vital upgrade



Nero's main burning tools work well but we encountered minor problems elsewhere

There was a time when merely burning a DVD required extra software, and Nero's Burning Rom was one of the best tools available for that job. These days, with Windows Vista able to burn DVD discs on its own and loads of free tools available for Windows XP users, it's easy to understand why the company has packed its flagship product full of extra tools.

The main Burning Rom tool is present, and with tools to create bootable discs and tweak burning settings it'll appeal to expert users. Those who don't want to mess with the finer points of the DVD file system will feel more at home with Nero Express, which uses a simpler task-based interface where the user can choose a project then drag and drop files.

The latest version of the Backitup tool isn't included in the suite, but there was a copy on the DVD we were sent and Nero's website currently offers a free copy with Nero 9. Also included on the disc is a trial version of Nero's Mediahome UPnP media server – given the significant price of the Nero 9 package we were disappointed that a full version wasn't included. Similarly, authoring HD Blu-ray discs requires an extra plug-in that costs \$10 (£6).

Most of the extra programs in the Nero suite work well. Photosnap is a simple photo-editing tool that allows non-technical users to perform the most common retouching tasks with a couple of clicks. Nero Vision has a slightly ugly interface, but it's a capable way to edit home movies, add titles and transitions then burn the results directly onto a DVD disc. Nero Rescue Agent, which was previously able to salvage files from optical discs only, can now use other media, and we used it to recover a deleted file from a USB

memory key. The Nero Live program, which can show and record TV, seems slightly redundant given that most Vista computers will already have the excellent Media Center PVR (personal video recorder) tool.

Some of the other tools in the suite have some noticeably rough edges. Nero Recode is still a great way to squash DVD movies down so that they'll fit onto a single-layer disc, but it also includes tools for converting video files into a format that will play on an Apple iPod or Sony PSP. We successfully converted an MPEG video file into iPod format, but attempting to do the same with a DVR-MS recording created by Windows Media Center failed, producing only a Directshow error. Nero tells us that fixes to improve this tool will be included in a future update. On a related note, the task of converting video to iPod is one of a few that we found oddly absent from the otherwise helpful Nero Smartstart tool that guides users to other parts of the suite.

Also missing from Smartstart and buried in the settings for Nero Vision is the option to upload finished videos directly to the web. Myspace and Youtube are supported alongside Nero's own My Nero service, but we were unable to upload to either My Nero or Youtube during testing. We reported the issue to Nero, who told us this was not a known issue reported by other users but that it would look into a fix.

It's important to note that these errors affected only peripheral areas of the Nero suite and that the main disc-burning tools, as well as the key functions of both Recode and Vision, worked fine. Nonetheless, at this price they're annoying, so hopefully an update will smooth out these problems, and leave Nero as a good, if slightly pricey, tool. For current users of Nero 8, though, we can see little reason to upgrade.

Tom Royal

Verdict

Pros Still does the basics well; includes many media tools; improved Rescue Agent is useful

Cons Video upload tool failed during testing; full Blu-ray support costs extra

Overall Disc tools work well, but small errors need fixing before we can recommend the whole suite

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £60

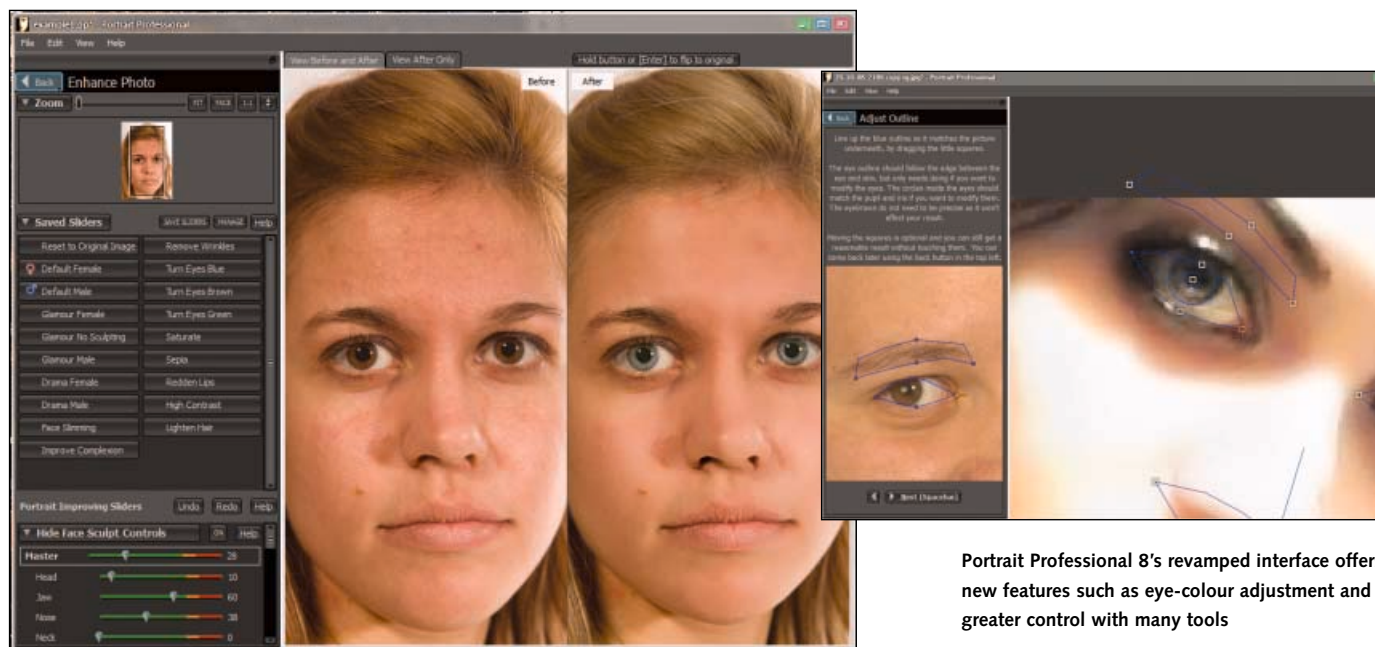
Contact www.nero.com/eng

System requirements Windows XP or Vista • IE6 • 1GHz processor • 256MB Ram (512MB in Vista) • 11.5GB hard disk space • 32MB graphics card • DirectX 9.0c • Internet connection required for some services

PHOTO-RETOUCHING SOFTWARE

Portrait Professional 8

Turn snaps into magazine-quality portraits in just a few mouse clicks



Portrait Professional 8's revamped interface offers new features such as eye-colour adjustment and greater control with many tools

If you were to use a tool like Adobe Photoshop, retouching a portrait could involve painstakingly removing blemishes and resculpting bones. With Portrait Professional all you need to do is wiggle a few sliders back and forth and watch the software transform the portrait before your eyes.

On loading your original image, you're prompted to click in a few selected locations. Just follow the examples and click. You'll be pointing out the eyes, nose and mouth but you don't need to be particularly accurate. Next, you'll be presented with a simple wireframe overlay which you click and drag into position over your subject's facial features. It only takes a few moments and really doesn't require any skill.

At this point the software takes over. After analysing the image it has a stab at retouching the picture for you. While this may not always result in a pleasing image, it's a pretty good starting point, from which you can begin making your own adjustments.

The key to creating a convincing portrait is subtlety. Portrait Professional is so easy to use and so effective that it's tempting to just grab the sliders and crank them up to the max. However, overdoing it with the sliders can easily transform your mother into a manga-eyed freak with a similarly cartoon-like complexion.

Thankfully the new version of the software helps you keep such tweaks in check, by colour-coding the effect sliders and dividing them into zones. If you want your results to look real, then keep within the green area. Venturing into the yellow and red zones will make far more drastic changes.

Exercise a little care and restraint and you'll be able to achieve an utterly convincing result. Side-by-side 'before' and 'after' views help you see the effects of

your edits in real time, allowing you to see how much you've altered the original image. If you've done your job well, the result will be an almost spookily better-looking version of your portrait that will easily pass for untouched.

Version 8 of the software offers a revamped user interface along with additional tools. These include the ability to alter the subject's eye colour and to thicken or re-colour hair. Some tools now provide greater control and overall usability has been increased.

A selection of presets allows you to make instant changes with a single click. These include glamorous or dramatic styles as well as quickly switching between brown, green or blue eye colours. However, the best results are achieved by manipulating the individual control sliders yourself.

Some of Portrait Professional's effects, such as colour adjustments, would be relatively easy to achieve in Photoshop, while others such as re-sculpting the face would be very difficult. In Portrait Professional everything is almost worryingly simple, be it removing spots, lengthening the nose, or changing hair colour.

To get truly professional results, you can polish off your image by using built-in masking tools to tidy up any areas that may need closer attention.

Even if your subject is beautiful to start with, you can still improve it, as many of the controls are designed to alter photographic parameters such as lighting and exposure, giving your photos a studio-like quality without the need to purchase costly equipment.

Portrait Professional is a superb piece of software at a great price. For a little more, a high-end version is available with 16-bit colour and Raw file compatibility as well as colour profile support.

Paul Monckton

Verdict

Pros Astonishing results for very little effort; easy to use; low price

Cons Low price means everyone will buy it

Overall Professional-looking results can be achieved in minutes with this software. It's powerful enough for real work, with a price low enough to make it worth buying just for fun

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £39.95

(This is the current 'half price' offer. Studio version is currently £59.95 under the same deal)

Contact

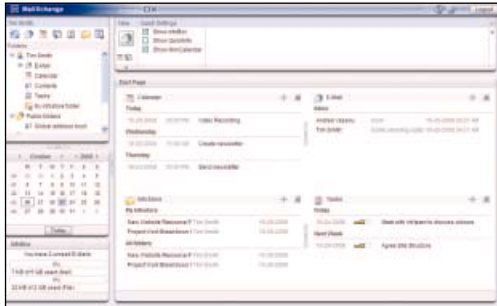
www.portraitprofessional.com

System requirements Windows Vista, XP or 2000, or Intel Mac OSX (10.4 or later)

HOSTED MAIL SERVICE

1&1 Mail Xchange

An online replacement for Exchange



There can be no denying the advantages of shared email and files for organisations large and small, but a full-blown Microsoft Exchange server is hardly practical for those who have neither the experience nor the budget. 1&1 Mail Xchange is a hosted service that is designed to avoid the need for a server in the office.

The 1&1 Mail Xchange web page works with Internet Explorer or Firefox. There is also a service for Windows Mobile users. The home page summarises the different sections of the service and there's also a nod to Office 2007, with a ribbon-like toolbar at the top of the screen.

The email editor has most of the luxuries you'd expect, including auto completion of addresses for known contacts. There doesn't appear to be a spellchecker though, and this could be a bit of a problem. We do like the preview pop-up window that appears when the mouse hovers over an email or other item. It has most of the options that appear in the main windows and helps speed up work.

Emails can be accessed by either Pop3 or Imap. Imap seems to be making something of a comeback and it does make sense for mobile devices, other than Windows Mobile. It's also worth noting that there is an SMTP server provided, and a Microsoft Outlook connector for direct access to the service; one for Thunderbird is also planned. Instructions are provided online for Outlook 2003 and 2007, and Thunderbird.

Tasks can include duration, percentage complete and even budgeting information, which is missing from many other services. The appointments section is just as versatile, and it's possible to click and drag to create appointments just as you would in Microsoft Outlook.

A separate login is used for administration; as well as setting up new accounts, it provides information on how much space users have taken up. Disk space is shared by all the users on the account. *Tim Smith*

Verdict

Pros Well-designed interface; other forms of access; storage space; Microsoft Outlook Connector

Cons No spellcheck in email; Windows Mobile devices only

Overall A good service for smaller organisations that cannot afford an Exchange server

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £8 approx per month per user, discounts for volume

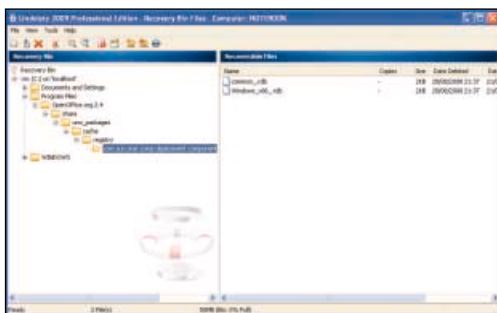
Contact www.1and1.co.uk

System requirements Internet Explorer or Firefox • Windows Mobile for mobile access

SECURITY SOFTWARE

Diskeeper Undelete 2009 Pro

Recover important files and Office documents with ease



If you're concerned about losing vital files and documents from your PC, it would be wise to invest in a file recovery application such as Undelete 2009.

The 'Pro' edition we tested enables you to recover files across a network, so it's ideal for those running multiple machines with a Lan at home. For half the price you can pick up the 'Home' edition, which offers a similar range of features without network support.

The initial installation enables you to run an instant recovery or set up the program on your system, which replaces the Windows recycle bin with Undelete's more powerful alternative. The former is a useful option as it prevents files being copied to your

computer, which could overwrite deleted content and prevent you performing an effective recovery.

Once installed you'll find a new recycle bin with a Windows Explorer-style interface, allowing you to browse by folder layout or perform a search for specific files or types of file on your computer's drives.

The new version improves on previous efforts by effectively eliminating the performance overheads involved in additional monitoring processes, as well as incorporating a 'Secure Delete' feature that uses industrial-strength algorithms to permanently delete content from a drive. You can also perform a 'clean wipe' that will do the same for an entire partition, and create a dynamic recovery bin that automatically adjusts the recoverable size limit based on how much free space you have available. Another feature of note is version recovery for Microsoft Office documents, which allows you to revert to previous versions of files even if you've overwritten the current one.

Undelete 2009 is very easy to use and offers an extra level of security that should offer peace of mind for home users. The unobtrusive nature of the software and its low price mean that there are very few reasons not to invest in an upgrade to the recycle bin – you'll feel more comfortable knowing it's there. *Paul Lester*



Verdict

Pros Works quietly in the background; document version protection; additional tools; cheap

Cons Not as powerful as more dedicated disk recovery solutions

Overall When you consider the low price of the software and the advantages it offers, it's difficult to think of a reason not to have something like this installed

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £15 approx (Home version) £30 approx (Pro version)

Contact www.undeleteurope.com

System requirements 600MHz processor • 100MB Ram • 50MB hard disk space • Windows Vista Editions, Windows XP (32-bit), Windows 2000 Professional

HOME DESIGN SOFTWARE

Grand Designs 3D

Plan home changes without moving a muscle



Once you familiarise yourself with using the software, it's fairly straightforward, so remodelling a room is a cinch

Home improvement software is not always the most intuitive type of program, and it's certainly not for the faint-hearted. But Grand Designs 3D has placed more emphasis than most on trying to avoid the headaches often associated with redesigning a home, or even just one room.

Built on the back of the popular Channel 4 TV programme, it offers three different packages catering for different budgets and visions: Kitchen & Bathroom; Renovation & Interior; and Self Build & Development.

We reviewed Renovation & Interior, which comes with Kitchen & Bathroom included, and tried remodelling a bathroom. Most interior designers and estate agents believe this room, along with the kitchen, can make or break the sale of a house.

The package comes with plenty of hints and tips, but first you need to get to grips with the way it works – you can't just dive in and hope your vision will enable you to use the software. If you want to take on the star of the TV programme Kevin McCloud at his own game and don't take time to find out how this application works, you'll quickly become frustrated. The first step is understanding the interface and learning how to use the dialogue boxes, which allow you to adjust default settings; for example, setting the floor size and room shape.

Although the software offers a step-by-step guide, it's probably best for newcomers to practise first with either one of the templates from the *Grand Designs* TV programme, or use the project assistant and basic templates.

You can toggle between a 2D floor plan and a 3D construction view using F12. To add furniture, go to the catalogue icon and drag and drop what you want

into the room. However, if you stay in the perspective view it's difficult to place furniture exactly where you want, or even to rotate it.

The application allows you to create multiple instances of an object. You can use the standard fittings and furniture provided in the catalogue, but if it doesn't fit you can tweak the sizes. This means that if you have particular furniture in mind you'd like to buy for a room, as long as you have the measurements you can tweak the size of furniture taken from the catalogue via the dialogue box.

The database of fixtures and fittings is comprehensive, and even includes toothbrush holders and towel rails, so each project can be fully furnished and decorated. The rendered images demonstrated nicely the effects of texturing, lighting and even shadows. At any time you can take a 3D walk through the design and examine details close up. You can even change from day to night view and add lighting for a more realistic overall impression.

If you're planning to have the work carried out by a professional, you can print the plans you have created in the format you wish; for example, A3 landscape. If you really get stuck, the software offers some tricks of the trade to help you start again.

Once mastered, this application is straightforward to use, but we can't stress how important it is to read the manual to make the most of it. It has received the thumbs up from professionals.

If you plan to remodel just one room, the Kitchen & Bathroom package is probably all you need. The software is complemented by a site at www.3Darchitect.co.uk, which has additional content users can download.

Dinah Greek

Verdict

Pros Easy-to-use planning program – once mastered; surprisingly addictive

Cons Steep learning curve

Overall A solid application that does what it says on the tin – once mastered. Could help prevent some costly remodelling mistakes

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £24.99 Kitchen & Bathroom;
£49.99 Renovation & Interior;
£199.99 Self Build & Development

Contact Eco Software
www.3darchitect.co.uk

System requirements 1GB hard disk space • DVD-Rom
• Windows XP/Vista

How we test

Performance testing is an important part of *PCW's* reviewing process, and to obtain our authoritative results we use the UK's best PC testing resource. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs

At the core of our PC performance tests are industry-standard benchmarks from Bapco and Futuremark. Sysmark 2007 Preview is the latest Vista-compatible version in a long line of Bapco benchmarks and it allows us, for the first time, to compare the application performance of Windows XP and Windows Vista-based systems with the same benchmark. It tests real-world application performance by running a series of scripts to mimic authentic user tasks. It loads and runs full versions of 14 market-leading applications, which are:

- Adobe After Effects 7
- Adobe Illustrator CS2
- Sketchup 5
- Adobe Photoshop CS2
- Autodesk 3ds Max 8
- Sony Vegas 7
- Macromedia Flash 8
- Microsoft Excel 2003
- Winzip 10
- Microsoft Outlook 2003
- Microsoft Powerpoint 2003
- Microsoft Word 2003
- Microsoft Project 2003
- Microsoft Windows Media Encoder 9 series

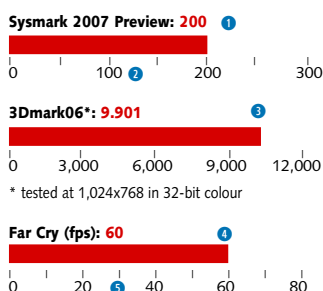
Note that scores from Sysmark 2007 Preview are not comparable to scores from previous versions of Sysmark. All scores are relative to the Sysmark reference machine, which scores 100 (see below for details).

In *PCW's* labs, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. Listed below are the main benchmarks we use for testing PC systems and components.

- Bapco Sysmark 2007 Preview – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark06 – the latest version of 3Dmark that tests DirectX 3D graphics performance.
- Games – we use built-in benchmarks in Far Cry and Fear to see how graphics cards perform in a real-world games.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

There's more information about our testing procedures and benchmarks on our Labs site at www.reportlabs.com/testbed/bguides/benchmarks.php.

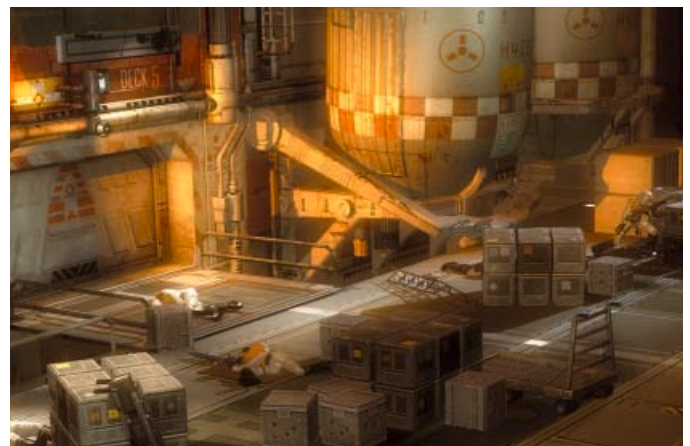
Performance



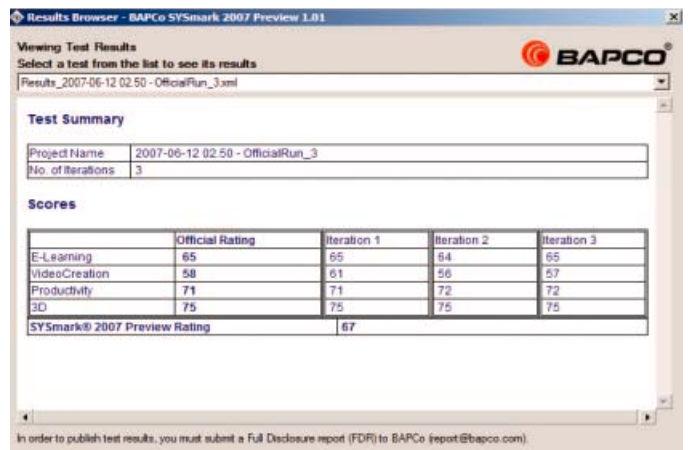
- ① A score of 200 indicates that the system is twice as fast as the reference PC.
- ② The reference PC (Intel Core 2 Duo E6300 1.8GHz, 1GB Ram) scores 100.
- ③ An Nvidia Geforce 8600GT would score in the region of 9,900.
- ④ Fear: A score of 60fps (frames per second) or higher is most desirable.
- ⑤ A result of 30fps or above means the machine can produce playable frame rates at the tested resolution.



PCmark05 measures memory, processor, graphics and hard drive performance



3Dmark06 is used to test 3D graphics performance



Sysmark 2007 Preview tests real-world performance using common apps

Best Buys

Your one-stop guide to the best-value products reviewed by PCW



With countless products available, shopping around for a new PC, peripheral or software package isn't an easy task, but with our Best Buys guide, you can make a quick purchase with confidence. We've split our Best Buys into 40 of the most popular categories, covering everything from desktop and notebook PCs right through to digital cameras and software.

Every month we'll update our Best Buys to include our most recent reviews and check the current pricing, although that's not to say you won't find a bargain online (try our price comparison site at

www.pcw.co.uk/bestprices). You'll also find the date of the magazine in which the product was first reviewed, along with an alternative suggested product for that category. If the Best Buy entry has a web code listed alongside it, this means you can read the full product review on our website. Simply head online and use the format [www.pcw.co.uk/\[web code\]](http://www.pcw.co.uk/[web code]) – for example, www.pcw.co.uk/2208243.

Each Best Buy product has gone through our rigorous testing and reviewing procedures, making this your one-stop guide to the best products on the market.

BUDGET PC



Zoostorm 3364-2354

Price: £499

Reviewed: July 2008

www.pcnextday.co.uk

Web code: N/A

This PC comes with a quad-core Intel Q6600 processor, 2GB of Ram, a 250GB hard disk and a 19in TFT. The only downside is the integrated graphics, but with expansion opportunities inside the case, this can be rectified.

HIGH-END PC

PC Specialist Fusion 4870X2

Price: £1,499

Reviewed: December 2008

www.pcspecialist.co.uk

Web code: N/A

A rare AMD-based system, this PC is perfect for high-end gaming and video editing. It features a dual-core 4870X2 graphics card, X4 9950 quad-core CPU and 8GB of Ram. You also get a decent 24in TFT.



ALTERNATIVE

Chillblast Fusion Sentinel

£699 **www.chillblast.com** **Web code:** 2211955

A well-built, quiet PC with a quad-core processor, good all-round performance and space inside for future upgrades. It also features a Geforce 8800GT graphics card.

ALTERNATIVE

Ultraviolet Genesis X0C

£4,464.93 **www.ultravioletmachines.com** **Web code:** N/A

The price may make your eyes water, but they don't get much faster than this, with an overclocked QX6850 and two 8800 graphics cards.

BUDGET NOTEBOOK



Samsung Q210

Price: £675.98

Reviewed: November 2008

www.samsung.com/uk

Web code: N/A

It's not suited to gaming, but this notebook has all the benefits of Intel's latest Centrino 2 platform. Powered by a T8400 Core 2 Duo processor clocked at 2.26GHz, it's a stylish workhorse computer.

HIGH-END NOTEBOOK

HP Pavilion dv7-1000ea

Price: £899

Reviewed: December 2008

www.hp.com/uk

Web code: N/A

Based on Intel's Centrino 2 platform, this notebook combines stylish design with high-end performance. It also has a Blu-ray reader and a crystal-clear 17in display. It's heavy, but as a desktop replacement it's perfect.



ALTERNATIVE

Hi-Grade D7000SRL

£499 **www.hi-grade.com** **Web code:** N/A

With a stylish chassis, decent performance, Bluetooth and HDMI, you get a lot for your money with this 15.4in notebook.

ALTERNATIVE

Acer Aspire 8920G

£1,289.99 **www.acer.com** **Web code:** N/A

Thanks to a recent price drop, this 18.4in notebook is now even better value for money. Highlights include a 2.5GHz processor and Blu-ray drive.

WINDOWS HOME SERVER



Fujitsu Siemens Scaleo 1900

Price: £469

Reviewed: July 2008

www.fujitsu-siemens.co.uk

Web code: N/A

It might not be the most attractive piece of computer kit, but this Windows Home Server from Fujitsu Siemens has good read-and-write performance and comes with some useful added extras.

ALTERNATIVE

Belinea 0.center

£386.58 www.belinea.com Web code: N/A

With a striking design and solid performance, the 0.center is a great little Windows Home Server with easy hard-disk access and good diagnostic tools.

ULTRA-MOBILE PC

MSI Wind

Price: £336.05

Reviewed: Christmas 2008

www.msicomputer.com

Web code: N/A

This netbook offers good battery life and a larger screen than many other models. With 1GB of memory and a 160GB hard drive, the MSI Wind is well specced all round and represents great value.



ALTERNATIVE

Acer Aspire One

£200 www.acer.co.uk Web code: 2220487

This portable notebook combines a decent keyboard, clever storage system and a great design. Its Intel Atom processor runs at 1.6GHz, backed up by 512MB of Ram.

BUDGET GRAPHICS CARD



Palit GeForce 9600GT 512MB Sonic

Price: £121.32

Reviewed: June 2008

www.palit.biz

Web code: N/A

The G94 GPU used by this card is basically a cut-down version of the G92 8800 and GTS cards, but with fewer, yet faster-clocked, stream processors.

ALTERNATIVE

Asus EAH2400Pro

£32.89 <http://uk.asus.com> Web code: N/A

This card features low power consumption and, although not as fast as the Radeon HD 2400 Pro cards, it's cheap and has some impressive video capabilities.

HIGH-END GRAPHICS CARD

Sapphire Radeon HD4870

Price: £181.76

Reviewed: October 2008

www.sapphiretech.com

Web code: 22233563

A fast card at a great price. To give an idea of the rendering potential of this card, it managed 46 frames per second with 4x anti-aliasing and 4x antroscopic filtering turned on at 1,280x1,024 resolution.



ALTERNATIVE

Zotac Geforce GTX 280 AMP Edition

£366.27 www.zotac.com Web code: 2223078

Zotac's version of the GTX 280 is the fastest single-core graphics card we've tested. The board also supports Nvidia's Hybrid Power technology.

TFT (17-22IN)



Philips 220WS8

Price: £189

Reviewed: February 2008

www.philips.co.uk

Web code: N/A

This 22in TFT screen has superb image quality, is evenly lit and with a power draw of just 35W is also extremely efficient. The icing on the cake is Philips' excellent pixel policy. A great buy.

ALTERNATIVE

Viewsonic VX2255

£259 www.viewsoniceurope.com Web code: N/A

The VX2255's clear and excellent pixel policy, along with its multimedia features, make it great value at £259, despite the distinctly average image quality.

TFT (24IN+)

Philips 240BW8

Price: £309.95

Reviewed: September 2008

www.consumer.philips.com

Web code: N/A

This 24in screen has a professional feel and is well suited to any application where you need to be sure that your on-screen colours are accurate. It also comes at a good price and features HDCP support.



ALTERNATIVE

Iiyama B2403WS

£299.60 www.iiyama.co.uk Web code: N/A

The 24in B2403WS from Iiyama offers a good balance of performance and features, and is suitable for a wide range of uses.

SMARTPHONE



Apple iPhone 3G

£ from free

Reviewed: December 2008

www.apple.com/uk

Web code: N/A

It might not have as many features as some of its rivals, but the iPhone benefits from outstanding ease of use, a superbly stylish design, 3G (new to this version) and an online applications store.

ALTERNATIVE

RIM Blackberry Bold

£ from free <http://eu.blackberry.com> Web code: N/A

Once the sole domain of business users, the Blackberry now features a similar level of consumer features as high-street phones.

SAT NAV

Tomtom Go 720

Price: £309

Reviewed: February 2008

www.tomtom.com

Web code: N/A

You're paying a bit more than you might for a number of perfectly capable rivals, but you get so much for your money with the Tomtom Go 720, including a customisable display and great performance on the road.



ALTERNATIVE

Mio 620t

£269 www.mio-tech.be Web code: N/A

Mio's new software is impressive and, considering the range of features, it's priced competitively. The maps look great and performance is equally good.

DIGITAL CAMCORDER



Canon HV30

Price: £700

Reviewed: November 2008

www.canon.co.uk

Web code: N/A

With fantastic picture quality, this camcorder is the one to buy if you're looking to make the most out of your HD television. It also has a great selection of manual controls and lets you edit your footage.

ALTERNATIVE

Panasonic HDC-SD9EB

£450 www.panasonic.co.uk Web code: N/A

Able to capture decent HD footage yet remaining light, portable and cheap, this Panasonic camcorder is a great buy for those on a budget.

DIGITAL CAMERA

Samsung NV24HD

Price: £249

Reviewed: October 2008

www.samsungcamera.com

Web code: N/A

With excellent build quality, a 10.2-megapixel CCD and wide-angle 24mm lens, this digital camera is perfect for taking detailed outdoor shots. It also features 720p movie recording, so you can capture video in high definition.



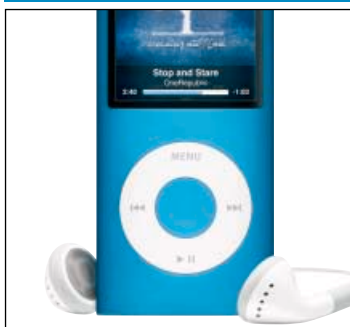
ALTERNATIVE

Pentax Optio A40

£219 www.pentax.co.uk Web code: N/A

This 12-megapixel compact camera houses some great features, not least of which is the excellent image stabiliser. It also shoots great photos.

PORTABLE MEDIA PLAYER



Apple iPod Nano

Price: £109

Reviewed: December 2008

www.apple.com/uk

Web code: N/A

Stylish and thinner than ever before, the new iPod Nano features motion sensors, allowing it to detect whether you're holding it in portrait or landscape mode, and a quick shake activates the shuffle mode.

ALTERNATIVE

Sony NWZ-A815

£89 www.sony.co.uk Web code: 2203060

It might lack some of the extra features found on rival players, but this Sony model excels in terms of audio quality and is easy to navigate.

MEDIA STREAMER

D-Link DSM-330

Price: £135

Reviewed: October 2008

www.dlink.co.uk

Web code: N/A

With its excellent usability and simple setup procedure, this device makes sharing your media collection simple. It features an HDMI port, can output 720p video and performs extremely well.



ALTERNATIVE

Archos TV+

£249 www.archos.co.uk Web code: 2210545

With a 250GB hard disk, this device not only streams media across a network, but can also store your entire video, music and photo collection locally.

LASER PRINTER



Brother HL-2170W

Price: £149

Reviewed: March 2008

www.brother.co.uk

Web code: 2207225

If you're looking for a good-quality monochrome laser printer for general home use, this Brother model is definitely worth considering. It's fast, compact and even has a wireless adapter. A bargain at this price.

ALTERNATIVE

Lexmark X500n

£301 www.lexmark.co.uk Web code: N/A

An amazingly good-value laser printer, considering it's not only colour but also includes a scanner, allowing you to scan, copy and print at speed.

PHOTO PRINTER

Canon Selphy CP750

Price: £110

Reviewed: October 2007

www.canon.co.uk

Web code: 2193769

It's a little bulky when in use, but this dedicated photo printer can produce high-quality prints in under 70 seconds. And a 2.4in display allows you to perform basic image editing before printing.



ALTERNATIVE

Sony DPP-FP90

£150 www.sony.co.uk Web code: 2196751

It's not particularly cheap to run, but this printer produces high-quality photos from a variety of sources and is reasonably fast as well.

MULTIFUNCTION PRINTER



Canon Pixma MP610

Price: £139

Reviewed: November 2008

www.canon.co.uk

Web code: N/A

Canon's compact and stylish MFD has a decent mix of top-notch quality and fast printing and can also print directly to DVDs. Running costs are relatively low, which is surprising given the low price tag.

ALTERNATIVE

HP Photosmart C8180

£298.45 www.hp.com/uk Web code: N/A

An expensive, but hugely impressive MFD, the Photosmart C8180 is packed full of useful features and is also incredibly easy to use.

NETWORK-ATTACHED STORAGE

Qnap TS-209

Price: £254

Reviewed: Christmas 2007

www.qnap.com

Web code: 2200223

If you're after a Nas device that does more than just share files over your network, this is it. You can schedule Bit Torrent downloads, stream media to UPnP devices and install your own drives in it.



ALTERNATIVE

Acer Aspire EasyStore

£499 www.acer.co.uk Web code: 2206105

This Nas device features 2TB of storage (other sizes are available), along with wireless, so you can place it anywhere in your home.

POWERLINE NETWORKING



Solwise NET-PL-200AV Push

Price: £50

Reviewed: March 2008

www.solwise.co.uk

Web code: 2207035

You'll need at least two of these to get your powerline network running, but they're the best around. Based on the Homeplug AV standard, they're fast, resilient to electrical noise and great value for money.

ALTERNATIVE

Devolo Dlan 200 AV

£149 www.devolo.co.uk Web code: N/A

Small and well designed, these Devolo powerline devices use the Homeplug AV standard and have pre-programmed quality of service rules built in.

WIRELESS ROUTER

Linksys WAG325N

Price: £99.99

Reviewed: May 2008

www.linksys.com

Web code: N/A

It might look a little unconventional, but this Draft-N router from Linksys performs extremely well. It also features some sophisticated tools, has VPN support and allows the creation of virtual wireless networks.



ALTERNATIVE

Solwise Engenius Wireless-N Gigabit Router

£120 www.solwise.co.uk Web code: N/A

It might be a little pricey, but this router performed well in our tests and comes complete with some advanced network filtering tools.

EXTERNAL HARD DISK



CMS V2ABS-CE-120

Price: £175

Reviewed: Christmas 2007

www.cmsproducts.com

Web code: 2202396

A portable USB2 external hard disk that weighs a mere 150g and comes with built-in 256-bit AES encryption. Inside the case sits a 2.5in 120GB 5,400rpm SATA notebook hard disk.

ALTERNATIVE

Western Digital Mybook Studio

£204 www.westerndigital.com Web code: 2206075

This stylish 1TB external disk comes with USB2, Firewire 800/400 and eSata interfaces for ultimate flexibility.

INTERNAL HARD DISK



Western Digital WD10EACS

Price: £185

Reviewed: January 2008

www.westerndigital.com

Web code: 2203061

This disk features four 250GB platters to provide 1TB of storage. It includes some advanced technology such as Intelliseek, which calculates optimum seek speeds to lower noise, vibration and power usage.

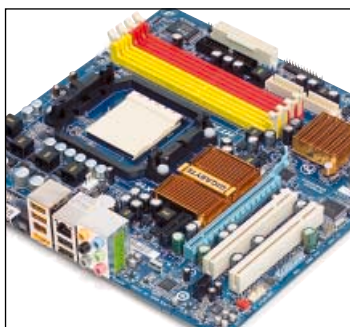
ALTERNATIVE

Toshiba MK2035GSS

£79 www.toshiba.co.uk Web code: 2203064

Weighing just 98g, this 200GB 2.5in SATA hard disk is perfect for increasing the storage capacity of your notebook.

AMD MOTHERBOARD



Gigabyte GA-MA78GM-S2H

Price: £60

Reviewed: June 2008

www.giga-byte.co.uk

Web code: N/A

With a wide range of ports, including eSata, and a good selection of options in the Bios, this is a great AMD board. Finally, after two years of losing to Intel, AMD's engineers have a winner on their hands.

ALTERNATIVE

EQS AB1S-RS690MKM

£46 www.eqsc Computers.com Web code: 2204803

The cramped design limits upgrade potential, but it's a keenly priced AMD motherboard that features an on-board HDMI port for HD video.

INTEL MOTHERBOARD



Asus P5E-VM HDMI

Price: £81

Reviewed: June 2008

<http://uk.asus.com>

Web code: N/A

This board has a great range of features. With the integrated graphics enabled, we comfortably overclocked it to 3GHz with our 2.4GHz Core 2 Quad Q6600 attached, so enthusiasts should take note of its capabilities.

ALTERNATIVE

Gigabyte GA-G31MX-S2

£53 www.giga-byte.com Web code: 2202711

Considering the price, you get plenty of features on this Intel board, including Intel's G31 Express chipset and ICH7 Southbridge.

PC CASE



Hipergroup Osiris

£79.90

Reviewed: November 2008

www.hipergroup.com

Web code: N/A

Despite its low price, this case features terrific build quality. And with easy-to-use latches, swapping out components is a cinch. It comes with four 3.5in and five 5.25in bays, and also looks great.

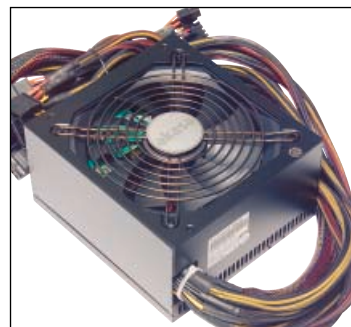
ALTERNATIVE

Akasa Omega

£139.81 www.akasa.co.uk Web code: N/A

Excellent build quality and some interesting design features make this a great case for those who are often changing components.

POWER SUPPLY



Akasa Powermax 1000

Price: £135.11

Reviewed: March 2008

www.akasa.co.uk

Web code: 2207736

This 1,000W power supply has two +12V rails and its single 135mm dual-ball-bearing fan makes it a lot quieter than you would expect. It also comes with a variety of power connectors.

ALTERNATIVE

Enermax Galaxy 1000W

£233.83 www.enermax.com.tw Web code: 2164011

The 1,000W Enermax Galaxy power supply will suit those with SLI graphics and other power-sapping components, but it comes at a fairly high price.

OFFICE SUITE



Microsoft Office 2007

Price: £357

Reviewed: May 2007

www.microsoft.com

Web code: 2183475

The new interface to Office is something you'll either like or loathe. We like it, but upgrading comes at a price, both in cash and in effort. Despite this, it's still the leader in office productivity software.

ALTERNATIVE

Corel Wordperfect X3

£276 www.corel.co.uk Web code: 2149856

This latest version of Corel's office suite includes tools such as PDF exporting, along with improved compatibility with other office applications.

SYSTEM UTILITY

Acronis True Image 11

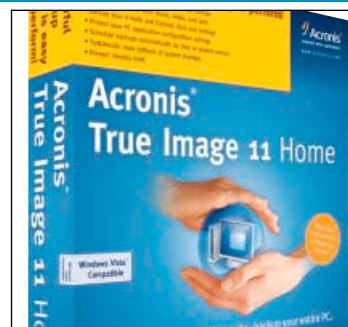
Price: £39.99

Reviewed: April 2008

www.acronis.co.uk

Web code: 2208669

True Image 11 is an excellent backup and recovery solution that offers an unprecedented level of control over disk cloning, scheduled backups and secure file deletion. And, despite the range of features, it's easy to use.



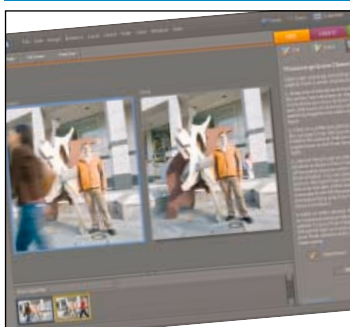
ALTERNATIVE

Paragon Hard Disk Manager

£29.99 www.paragon-software.com Web code: 2205339

A comprehensive, all-in-one suite of hard-disk maintenance and backup tools that's easy to get to grips with and comes at a good price.

IMAGE EDITING



Adobe Photoshop Elements 7

Price: £76.38

Reviewed: December 2008

www.adobe.co.uk

Web code: N/A

Some of its advanced tools and special effects might not be required by most amateur photographers, but Adobe Photoshop Elements remains the standard that rival image editors must compete against.

ALTERNATIVE

Corel Paint Shop Pro X2

£79 www.corel.com Web code: N/A

A little more expensive than its main rival, Photoshop Elements, but Paint Shop Pro X2 excels in terms of ease of use.

VIDEO EDITING

Pinnacle Studio 12 Ultimate

Price: £90

Reviewed: October 2008

www.pinnacle.com

Web code: N/A

Pinnacle has stuck with its usual intuitive interface and added a host of extra features, including new special effects and the ability to import full HD video from AVCHD sources. It can also export direct to Blu-ray.



ALTERNATIVE

Adobe Premiere Elements 7

£76.38 www.adobe.co.uk Web code: N/A

Suited to beginners as well as more experienced users who know how to make the most of its powerful special effects and editing tools.

PC SECURITY



Bitdefender Total Security 2009

Price: £44.95

Reviewed: January 2009

www.bitdefender.com

Web code: N/A

A comprehensive suite that's easy to use, and has fast scan times and low system overheads. With extra tools including backup and parental controls, this is a good all-rounder.

ALTERNATIVE

Kaspersky Internet Security 2009

£39.99 www.kaspersky.com Web code: N/A

An excellent security suite with top-class anti-virus protection and one-click problem solving.

WEB DESIGN

Adobe Dreamweaver CS3

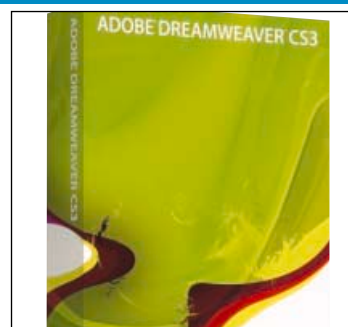
Price: £393

Reviewed: July 2007

www.adobe.com

Web code: 2186591

Powerful HTML coding and design tools along with CSS templates and Ajax widgets will help non-programmers get started. There's also a big emphasis on CSS, including a CSS Advisor tool for newcomers.



ALTERNATIVE

Microsoft Expression Web

£260 www.microsoft.com Web code: 2185242

Expression Web is a very good web-editing suite if you accept the inevitable Microsoft bias, and features CSS support and a powerful interface.

BUSINESS PC



Dell Latitude D531

Price: £586

Reviewed: October 2007

www.dell.com

Web code: N/A

With a dual-core AMD Turion processor clocked at 1.8GHz, 2GB of Ram and Vista Business, this is a good budget model. It also features a built-in DVD writer, 120GB SATA hard disk and both Wifi and Bluetooth.

ALTERNATIVE

HP Compaq dc7800

£598 www.hp.co.uk Web code: 2207533

The space-saving design of this affordable business desktop is very compelling and it can attach directly to an optional HP TFT screen.

BUSINESS PRINTER

HP Laserjet P1505n

Price: £205.63

Reviewed: June 2008

www.hp.com

Web code: N/A

Compact, stylish and quicker than it looks, this Laserjet from HP is a very capable small-business printer and is stunningly good value to boot. It also features an integrated network interface.



ALTERNATIVE

Zebra P100i

£1,245.50 www.zebracard.com Web code: 2212221

A great device for small businesses needing to print plastic cards in volume. It takes up little desk space and can print in full colour.

NETWORK SECURITY



Smoothwall Smoothguard 1000-UTM

Price: £3,231.25

Reviewed: September 2007

www.smoothwall.net

Web code: 2194393

A comprehensive array of security tools, load balancing and failover facilities, plus extensive reporting options, mean this network security device justifies the high price.

ALTERNATIVE

Webroot Antispyware Corporate

£22.56 www.webroot.com Web code: N/A

At this price you get a one-year licence for 10 users, which is great value. It also covers two key client security bases in one go.

NETWORK MANAGEMENT

VMware Thinapp 4.0

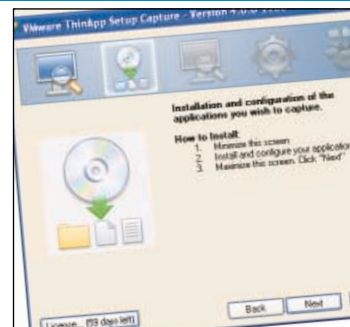
Price: £2,937.50

Reviewed: November 2008

www.vmware.com

Web code: N/A

Although its cost may be an issue for small businesses, Thinapp overcomes many of the issues associated with deploying and managing applications. It features on-demand streaming, USB key deployment and more.



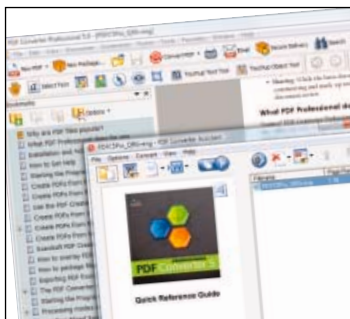
ALTERNATIVE

Prefix IT PrefixNE

Up to £2.94 per PC per month www.prefixit.com Web code: 2205651

Easy to install and use, this network management application allows you to keep track of all the kit on your network and is perfect for small businesses.

COLLABORATION SOFTWARE



Nuance PDF Converter Professional 5

Price: £99

Reviewed: June 2008

www.nuance.co.uk

Web code: N/A

It may often take second billing to Adobe Acrobat, but this latest release is cheaper and just as good - if not better. The only problem is there are so many new tools to learn.

ALTERNATIVE

C2C Archive One Policy Manager

£40 www.c2c.com Web code: 2212370

This is a well-conceived and easy-to-implement exchange storage management tool that can enhance performance and even reduce costs.

BUSINESS ACCOUNTS SOFTWARE

Microsoft Accounting 2008

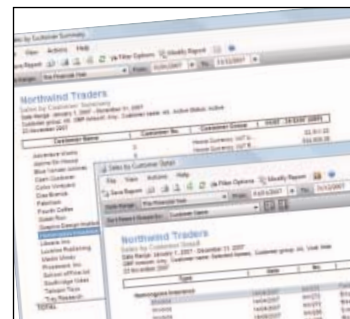
Price: £149

Reviewed: February 2008

www.samsung.co.uk

Web code: 2207529

A late entrant to the UK accounting market, Office Accounting 2008 is easy to use, feature-rich and will shake up the competition. It also offers in-depth integration with Outlook 2007 Business Contact Manager.



ALTERNATIVE

Intuit Quickbooks Pro 2008

£299 www.quickbooks.co.uk Web code: 2203178

A sensible update to what is one of the most accessible and easy-to-master small-business accounting packages around. Syncs with Outlook.



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ON TEST

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Editor's Choice

'Log into them from any web-connected PC and keep an eye (and in some cases an ear) on what's going on back home or in the office'

Network cameras

If you want to keep an eye on your home, which IP camera will be the safest bet? Will Stapley investigates

Unlike standard webcams, IP cameras (also known as network cameras) operate independently of a computer, hooking up via your router and making themselves accessible over the internet. This means you can log into them from any web-connected PC and keep an eye (and in some cases an ear) on what's going on back home or in the office. Some even support RTSP (Real Time Streaming Protocol), potentially letting you view live streams on your mobile phone.

As with any other purchase, it's best to decide exactly what you'll use it for before getting your credit card out. It's easy to be tempted by an IP camera that offers infra-red night-vision, for example, but during the daytime it'll give

you wildly inaccurate colour reproduction. And while cameras that offer pan and tilt functions are undoubtedly impressive, they also add a considerable amount to the price, and may not be necessary if you just want to keep an eye on one thing.

If you plan to monitor scenes close up, it's advisable to choose a model with a variable-focus lens. Those with fixed-focus lenses are designed to monitor objects from a distance of around 1m or greater.

We've rounded up eight models for this group test, and all support both wired and wireless networking. Manufacturers' RRP's are quoted for each, but you can find most of them far cheaper online.

D-Link DCS-2120

Price £149 **Contact** D-Link 020 8955 9000 www.dlink.co.uk



Tall and slim, the DCS-2120 is a plain-looking IP camera with a light on the front indicating network status. None of the cameras on test has optical zooming, although some, including the D-Link, have a digital alternative. We usually frown on digital zooms, but a small amount can be useful on IP cameras and this model has a 4x digital zoom.

During testing, the DCS-2120 managed to produce good-looking video in both indoor and outdoor

environments. Images are full of bright, vivid colours and exhibit a good level of detail. Should you want to tinker with the image, saturation and hue controls are on hand, along with brightness and contrast levels; somewhat annoyingly, these are only available from the setup menus and not the live view screen.

Using Real-Time Streaming Protocol (RTSP), we managed to stream video to a mobile phone, but first you have to make sure that the camera's video is configured for mobile video as well as tweaking various settings not covered in the user guide. Unless you're network-savvy, you're likely to run into problems. Indeed, this is the case with all models on test that offer RTSP support.

A common feature with all the cameras here is the ability to set up email alerts when the motion detector is activated, and to have footage uploaded to an FTP server of your choice. D-Link allows for details of two FTP and two email servers.

Beware when shopping around for the DCS-2120: we found a few online retailers selling it for well over £200. D-Link has the price at £149 but, as with most models here, you can find it a fair bit cheaper, with a couple of sites selling it at around £115.

If it's high-quality video you're after, the DCS-2120 will serve you well.



Verdict

Pros Robust design; good video quality

Cons Light on features

Overall Good video quality, but lacking some advanced features

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Intellinet Wireless Day/Night IP Camera

Price £199 **Contact** Fairline 01622 716 688 www.fairline.co.uk



Looking much like a traditional CCTV security camera, the Intellinet Wireless Day/Night IP Camera will certainly act as a good deterrent. Despite its name, it doesn't have the infra-red LEDs found on the night-vision cameras in this group test. Instead, it attempts to boost low-light performance using its 0.33in CCD lens. It's the only camera here to opt for a CCD sensor over the Cmos alternative.

There's no stand included in the package, but

Intellinet supplies a mount that can be screwed to a wall. If this doesn't suit, you'll need to buy a separate stand (a standard photographic tripod-style attachment). You adjust the focus by loosening a screw and manually twisting the long, protruding lens.

The camera lacks a built-in microphone, but a mic-in socket lets you attach an external one. If you hook up a speaker to the line-out socket, the Intellinet will provide you with two-way audio conversations to accompany the video.

However, the video quality is mediocre. It's by no means the worst on test and does a good job of reproducing colours, but focus is lost towards the edges and compression artefacts ruin what should be a sharp, clear image. Areas of high contrast, such as the sun shining through a window, are plagued with purple fringing. Night performance is on a par with the other non-infra-red cameras, so despite its name we wouldn't recommend the Wireless Day/Night IP Camera for night use.

FTP and email functions are built in, but although RTSP is supported, the device can't stream 3GP (Third Generation Partnership Project) video to mobiles.

The Intellinet is a sturdily built camera that's reasonably easy to operate. But at this price we were expecting more in terms of the video quality.

Verdict

Pros Robust build; easy to operate

Cons Expensive; video quality not great

Overall Video quality should be better for this price

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Linksys WVC200

Price £249 **Contact** Linksys 0800 068 0327 www.linksys.com



The WVC200 is a bulky IP camera with a large, bulbous lens shield protruding from the front.

Linksys supplies a lightweight plastic stand to slide the WVC200 into, but it's easily knocked over and this heavy camera really requires more in the way of support.

A series of LEDs on the camera tell you its current status, and a small LCD shows its current IP address; the latter is useful during setup, but pointless thereafter.

Although the pan and tilt lens offers the ability to monitor a wide area, we were shocked at the loud grinding noise emitted by the motor. If you're planning on discreet monitoring, you'll be disappointed by the racket it creates. It also pans on an arc, so at either extreme of its horizontal movements you'll be presented with slightly slanted video.

We didn't encounter many problems with the web-based interface, although the lack of controls on the live view screen is frustrating, and you have to enter the configuration menu to alter simple settings such as brightness.

The fish-eye lens delivers accurate colour, although it can't match the clarity of the Panasonic and D-Link models on test. A built-in microphone adds audio to the video, but there's no external speaker attachment. Furthermore, this model doesn't support RTSP, so streaming to devices such as mobile phones is out.

Linksys suggests a retail price of £249 for the WVC200, which is way too high for such a device. Most online retailers have it for around £180, but if you're looking for an IP camera with a pan and tilt lens, and your budget allows, we'd recommend the Trendnet model. Otherwise, your best bet would be to opt for the similarly priced Panasonic BL-C131, which offers superior image quality.

Verdict

Pros Pan and tilt lens; good colour reproduction

Cons Noisy during lens movement; compression hampers video quality

Overall A noisy pan and tilt function and some compression issues hold this camera back

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Panasonic BL-C131

Price £229 **Contact** Panasonic 0844 844 3856 www.panasonic.co.uk



Asquat, compact unit, the BL-C131 is a pan and tilt camera that lets you scope out a wider area than the fixed cameras on test.

Thanks to the huge array of options in the web-based interface, you can tailor the camera's operation to suit your specific needs. One particularly useful feature is the ability to set specific times when the camera should switch on its motion-detection feature. The menu system isn't the easiest to navigate,

though, with apparently simple tasks requiring you to go through multiple screens.

The motion-detection system is a little more sophisticated than others, and is able to detect heat as well as movement, so you should experience fewer false alarms. It also has a handy Privacy button on the front that you press to slide the lens out of view.

Video quality is very impressive. Colours are a little washed out, but its video is second only to the D-Link model. It's also quick to adjust to changing light levels, though poorly lit scenes do tend to look a little grainy.

The BL-C131 isn't silent when the lens is moving, but it's nowhere near as loud as the Linksys camera. The pan and tilt range also feels a little cramped compared with the Linksys and, to a greater extent, Trendnet models. Digital zooming up to 10x can be activated by simply rolling the mouse wheel while hovering over the live video stream.

The interface could do with being simplified and the device lacks the night vision offered by some similarly priced cameras, but the BL-C131 offers a great mix of features. Were it actually for sale at the price that Panasonic quotes, it would not have scored so well, but the fact is that you can pick this camera up for well under the RRP, with many online stores selling it for less than £180.



Verdict

Pros Video quality; movable lens; good range of features

Cons Interface unnecessarily awkward; pan and tilt feature feels a little cramped

Overall A great mix of features and decent video quality make this a good choice

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Solwise SEC-C1002W-IR

Price £113 **Contact** Solwise 0845 458 4558 www.solwise.co.uk



Housed in a robust, waterproof case, the SEC-C1002W-IR is primarily designed for outdoor use. A shielded cable at the rear leads to the Ethernet and power sockets along with three further connectors, allowing the camera to trigger other devices when, for example, motion is detected.

Setup wasn't particularly easy. We only managed to access the live video by changing our browser's security setting to allow ActiveX downloads from

unsigned sources – something that wasn't required by any of the other cameras on test.

Once up and running things are kept reasonably simple, with the main menu split into three sections: Visitor, Operator and Administrator. The Administrator menu isn't quite so easy to navigate, with advanced settings such as FTP, email and the network connections all in one big list.

But it's video quality that really lets this camera down. It was by far the worst in our test, with images looking very blurry: close-up objects really suffer. It's a shame, since night-vision performance is excellent, with 25 infra-red LEDs illuminating in excess of 20m in total darkness. You can't manually control when the LEDs kick in, but it's the only camera here that can adjust the LED power depending on nearby lighting.

The lack of support for WPA wireless encryption is disappointing, as is the inability to automatically detect your wireless network settings. It's also the only camera without a built-in microphone.

In its favour, the SEC-C1002W-IR is extremely cheap: you'd be hard pushed to find many other infra-red models at this price. The robust, waterproof chassis also makes it ideal for outdoor use. The poor image quality will be unacceptable to many, but the camera does excel at night-time viewing.

Verdict

Pros Excellent performance at night; waterproof chassis; cheap

Cons Very poor video quality; few extra features

Overall Powerful night vision is marred by poor video quality

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Swann IP-3G Connectcam 1000

Price £199 **Contact** Swann 020 3027 0979 www.swannsecurity.com



Well-built and with a sturdy metal stand, the IP-3G Connectcam 1000 is another camera with infra-red LEDs for night vision.

A USB port on the side allows you to store recorded images locally, but if you're using the camera for security purposes it's all too easy for someone to simply remove the USB stick.

However, as with all the other models on test, you can instruct the camera to upload content to an FTP

server and alert you via email when activity is detected.

The web-based interface is clear and intuitive, although you get no manual control over the infra-red LEDs. And since the camera tends to be trigger-happy when it comes to switching the LEDs on, colour and clarity is often lost unnecessarily in low but adequate light conditions. With just seven infra-red LEDs, the Swann struggles to match the night performance of the Solwise and Y-Cam devices, but it illuminates up to around 10m reasonably well.

Daytime performance is acceptable, with clear, well-detailed video, but colours appear washed out: bright outdoor scenes look totally colourless. Thanks to the built-in microphone and a line-out socket, two-way audio is possible if you hook up a speaker. It's a shame that none of the cameras in this group test features a built-in speaker.

Thanks to RTSP and 3GP support, we were able to stream live video to a mobile phone, but as with all the other cameras here that support this feature, it was a pain to configure and better documentation is required.

This camera offers decent, if slightly colourless, video quality along with infra-red night-vision, but it really needs to offer manual control over the infra-red LEDs. It's also quite expensive, with the better-featured Trendnet model available for just a little extra.

Verdict

Pros Reasonable video quality; intuitive interface

Cons Infra-red LEDs too eager to switch on; poor colour in daytime video; expensive

Overall An easy-to-use IP camera, but expensive for what you get

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

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Trendnet TV-IP422W

Price £214 **Contact** Trendnet 0800 6076 7667 www.trendnet.com



The TV-IP422W from Trendnet isn't the only camera on test with pan and tilt capabilities, but with a horizontal panning range of 330° it offers the ability to monitor a far wider area than any other model here.

The motor that moves the lens is also extremely smooth and quiet, unlike that of the Linksys camera. It does, however, feel a little flimsy and may not cope well with being dropped.

Like the Swann, the TV-IP422W supports two-way audio; there's a built-in microphone and a socket for an external speaker. The similarities with the Swann Connectcam don't stop there. Although the interface looks different, the menu options available are almost identical, indicating that both companies use the same software to drive their cameras. That's no bad thing though, since the menu is easy to navigate.

Video quality is very similar to the Swann camera. The only noticeable difference is that the TV-IP422W gives a wider field of view, the downside of which is that the fish-eye lens distorts the picture at the edges; in our opinion, though, it's a sacrifice worth making.

A GPIO (general purpose input/output) connector at the rear enables the camera to trigger external devices such as an alarm. There's also a USB port that can be used to import wireless network settings quickly as well as to download images and video to a USB key, although the latter isn't a particularly secure way to store footage.

The poor colour reproduction of the TV-IP422W will put some people off, as will its relatively high price, but this camera can't be beaten in terms of the area it lets you monitor and it also comes with a decent array of features. If you can afford it, this is a quality IP camera for round-the-clock monitoring.

Verdict

Pros Wide coverage; quiet in operation; good video quality

Cons Expensive; poor colour in daytime video

Overall Plenty of features and an intuitive interface make this a great night-vision camera

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Y-Cam Knight

Price £149 **Contact** Y-Cam 0845 5000 247 www.y-cam.com



A small, compact camera festooned with no fewer than 30 infra-red LEDs, the Y-Cam Knight certainly looks the business. The LEDs, along with the lens, are protected from damage by a plastic shield, although this means there's no way of altering the focus for close-up monitoring.

It comes with a built-in Wifi antenna, so you can't replace it with a hi-gain model (one that provides better reception). The Panasonic model is the only

other camera with the same problem. As with the rest on test you can fall back on wired Ethernet if you're out of wireless range.

A note in the packaging states the camera is designed for night vision and colours won't be totally accurate. Due to their extra infra-red sensitivity, all night vision cameras suffer from poor colour reproduction, and the Y-Cam is no different. In certain situations, it added a heavy purple tint to the video.

Of the night-vision cameras on test, we prefer the daytime performance of the Swann and Trendnet models. However, at night the Knight excels and manages to illuminate pitch-black scenes well. And thanks to its fish-eye lens it manages to give you a wide if somewhat distorted field of view.

A nice touch is the ability to turn off the infra-red LEDs manually. You can also prevent the camera from automatically switching to black and white mode when the lighting is poor. This is the only night-vision model here to offer this functionality and it's something its competitors would do well to copy.

As with all the night-vision cameras, the poor colour reproduction is annoying and overall image quality could be sharper, but with its easy-to-use interface, good range of features and, above all, low price the Y-Cam Knight has a lot going for it.

Verdict

Pros Cheap night-vision camera; easy-to-use interface

Cons Heavy purple tint to daytime video; poor-quality video

Overall A decent, low-cost night-vision camera

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

IP cameras

				
MANUFACTURER	D-LINK	INTELLINET	LINKSYS	
Model	DCS-2120	Wireless Day/Night IP Camera	WVC200	
Price	£149	£199	£249	
Average street price	£149	£199	£180	
Sales number	020 8955 9000	01622 716 688	0800 068 0327	
URL	www.dlink.co.uk	www.fairline.co.uk	www.linksys.com	
SPECS				
Sensor	0.25in Cmos	0.33in CCD	0.20in Cmos	
Resolutions (maximum frame rate)	640x480, 320x240, 176x144, 160x120	720x576, 640x576, 352x288	640x480, 320x240, 160x120	
Zoom	4x digital	✗	2x digital	
Pan (left/right)	N/A	N/A	67°/67°	
Tilt (up/down)	N/A	N/A	30°/34°	
Light sensitivity	0.5 lux	0.1 lux	2 lux	
Infra-red night-vision (number of LEDs)	✗	✗	✗	
Wireless	802.11b/g	802.11b/g	802.11b/g	
Wired	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec	
Video streaming	MPEG-4-SP	MPEG-4-SP, MJPEG	MPEG-4-SP, MJPEG	
Frame rate (maximum)	30fps	25fps	30fps	
Wireless encryption	Wep/WPA	Wep/WPA	Wep/WPA	
Removable Wifi antenna	✓	✓	✓	
Built-in microphone	✓	✗ (Mic-in socket)	✓	
Line-out	✗	✓	✗	
Email notifications	✓	✓	✓	
FTP support	✓	✓	✓	
RTSP support	✓	✓	✗	
3GP support	✓	✗	✗	
External I/O connectors	✗	✓	✗	
Power over Ethernet	✗	✓	✗	
Dimensions in mm (wxdxh)	73x27x115	87x158x45	175x32x199	
Weight	185g	1,100g	458g	
SCORES				
Features	★★★★★	★★★★★	★★★★★	
Performance	★★★★★	★★★★★	★★★★★	
Value for money	★★★★★	★★★★★	★★★★★	
OVERALL	★★★★★	★★★★★	★★★★★	

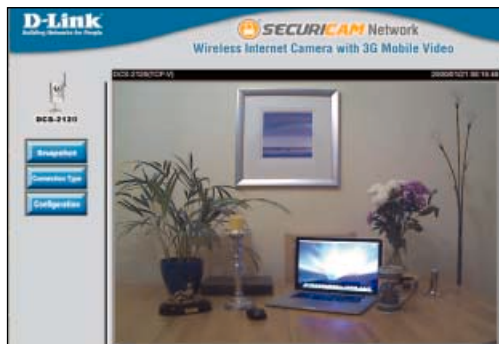


PANASONIC	SOLWISE	SWANN	TRENDNET	Y-CAM
BL-C131	SEC-C1002W-IR	IP-3G Connectcam 1000	TV-IP422W	Knight
£229	£113	£199	£214	£149
£180	£113	£199	£214	£130
0844 844 3856	0845 458 4558	020 3027 0979	0800 6076 7667	0845 5000 247
www.panasonic.co.uk	www.solwise.co.uk	www.swannsecurity.com	www.trendnet.com	www.y-cam.com
0.20in Cmos	Cmos (size not specified)	0.25in Cmos	0.25in Cmos	0.25in Cmos
640x480, 320x240, 160x120	640x480, 320x240	640x480, 320x240, 160x120	640x480, 320x240, 160x120	640x480, 320x240, 160x120
10x digital	✗	3x digital	3x digital	2x digital
50°/50°	N/A	N/A	165°/165°	N/A
10°/40°	N/A	N/A	90°/15°	N/A
3 lux	0 lux	0.5 lux	0.5 lux	0 lux
✗	✓ (25)	✓ (6)	✓ (7)	✓ (30)
802.11b/g	802.11b/g	802.11b/g	802.11b/g	802.11b/g
10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec
MPEG-4-SP, MJPEG	MPEG-4-SP	MPEG-4-SP, MJPEG	MPEG-4-SP, MJPEG	MPEG-4-SP, MJPEG
30fps	25fps	30fps	30fps	30fps
Wep/WPA	Wep	Wep/WPA	Wep/WPA	Wep/WPA
✗	✓	✓	✓	✗
✓	✗	✓	✓	✓
✗	✗	✓	✓	✗
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
✓	✗	✓	✓	✓
✗	✗	✓	✓	✓
✗	✓	✗	✓	✗
✗	✗	✗	✗	✗
98x73x74	72x174x80	70x57x100	115x110x105	85x85x30
210g	650g	170g	355g	150g
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
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Cameras on test

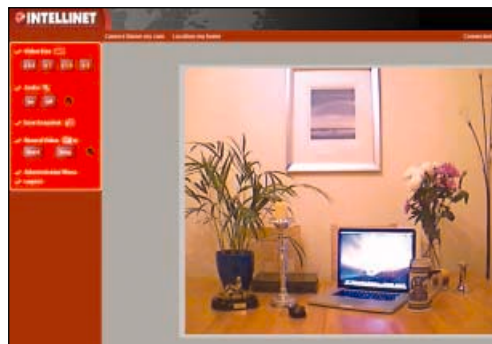
We put each camera in the same location and took a screenshot of the test scene. The shots also show the differences in the field of view between cameras. Note that video compression artefacts aren't as noticeable on still images like these

D-Link DCS-2120



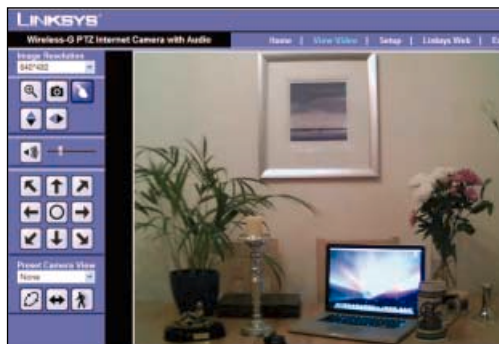
With accurate colours, good field of view and sharp, clear images, we preferred the D-Link's video over the competition.

Intellinet Wireless Day/Night IP Camera



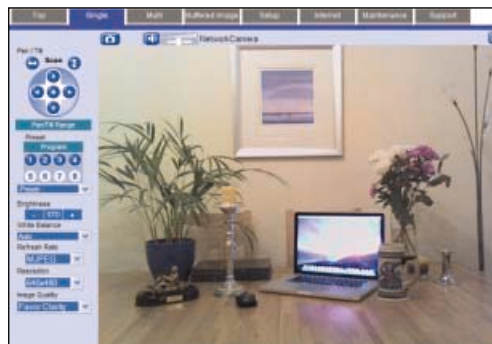
Vivid colours make for an attractive shot, but fine detail is lost and the camera has a fairly narrow field of view.

Linksys WVC200



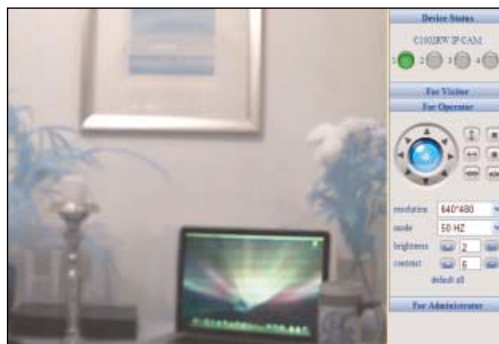
Colour is accurately reproduced and the Linksys does a good job with exposure, but focus is lost towards the edges.

Panasonic BL-C131



With a wide field of view, the Panasonic captures very good-quality video, although it can be grainy in low light.

Solwise SEC-C1002W-IR



The image says it all: this is not a camera for those interested in high-quality video. The Solwise's strength lies in night vision.

Swann IP-3G Connectcam 1000



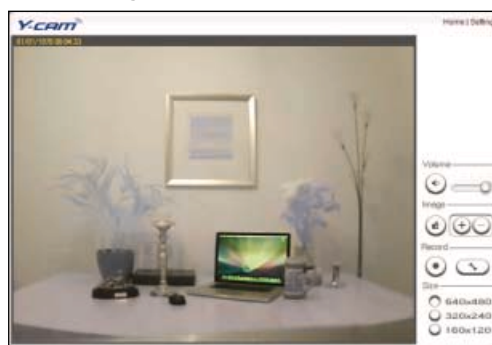
Sharp, clear video, but the infra-red-sensitive Cmos sensor hampers colour reproduction.

Trendnet TV-IP422W



Almost identical to the Swann camera, the Trendnet suffers from the same colour issues, but once again it's a sharp image.

Y-Cam Knight



With the widest field of view, the Y-Cam can monitor a wide area, but the infra-red sensor causes it problems indoors.

What to look for in a night-vision camera



Although the video quality is poor, the Solwise's night-vision is impressive



The night-vision on the Trendnet struggles to match that of the Solwise

Four of the eight cameras on test – Solwise, Swann, Trendnet and Y-Cam – offer infra-red night-vision. These cameras house Cmos sensors (or, in the case of the Solwise, a CCD sensor) that are sensitive to infra-red light. Combined with built-in infra-red LEDs, they deliver watchable video, even in pitch-black conditions.

How well each camera performs depends on the infra-red sensitivity of the sensor along with the amount of infra-red light emitted by the built-in LEDs. Any nearby lighting will help give the video a boost.

Of the models here, the Solwise with its 25 powerful infra-red LEDs is by far the best at illuminating night-time scenes; it's just a shame the actual quality of the video is so poor. Close behind is the Y-Cam with its 30 LEDs, while coming in a fairly distant joint third are

the Trendnet and Swann, which house only seven and six infra-red LEDs respectively.

The big downside of night-vision cameras is that infra-red-sensitive sensors can't reproduce colour very accurately in well-lit environments.

It's worth noting that only the Solwise is suitable for outdoor use, and if any are placed so that they look outside through a window, the infra-red lights will reflect off the glass, effectively ruining the video. An alternative is to buy an outdoor casing (Y-Cam sells one for its Knight camera at £69) or, if you want to keep the camera inside, an external infra-red emitter and position it on the other side of the window.

Although the ability to see in the dark may sound impressive, cameras with infra-red-sensitive sensors do have significant drawbacks.

Editor's Choice

Editor's Choice Panasonic BL-C131

Recommended D-Link DCS-2120 • Trendnet TV-IP422W



Panasonic BL-C131



D-Link DCS-2120



Trendnet TV-IP422W

Of all the cameras on test, the Panasonic BL-C131 stood out and offers the best balance of performance and price. It might not have infra-red night-vision, but it gives good-quality and accurate video, and comes with a pan-and-tilt lens. Widely available for well under the RRP, it fully deserves our Editor's Choice award. If there's one thing we'd like to change on the Panasonic, it's the fiddly interface. Compared with some of the other models on test, it feels unnecessarily complicated and setting up features such as timed monitoring

can be tiresome. The video can also be grainy in poor lighting, but it's not a major problem.

All the infra-red night-vision cameras give poor colour reproduction during the day. It varies from camera to camera, with the Y-Cam Knight suffering the most, sometimes adding a purple tint to the video. If you want a night-vision camera, poor daytime performance is something you'll need to take into account. The Solwise performs best at illuminating pitch-black scenes, but the blurry, low-quality video makes it unsuitable for close-up monitoring. It also has a

fairly narrow field of view. Overall, we prefer the mixture of day and night performance offered by the Swann and Trendnet models. Thanks to its excellent features, including the ability to monitor a huge area, the Trendnet TV-IP422W picks up a Recommended award.

Our final Recommended award goes to the camera that produces the most detailed and accurate video: the D-Link DCS-2120. It might not have the impressive motorised lenses of some others, but it offers simple and effective monitoring if you demand high-quality video. **PCW**

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- 100 Norton 360 v2
Panda Global Protection 2009
- 101 PC Tools Internet Security
2009
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Editor's Choice

'Many developers are attempting to get one up on the competition by adding extra features'

Maximum security

Paul Lester puts a dozen security suites through their paces

Capable security software is a must for every home user, and that need is reflected in the wide range of solutions available to help you protect your PC and stay one step ahead of the latest threats.

There are plenty of security options to choose from and many developers are attempting to get one up on the competition by adding extra features such as online storage, tune-up utilities and intuitive protection to try and offer the home user a straightforward all-in-one solution. Since security and maintenance are the sorts of things that most

people would want to manage with a minimum of fuss we think it's a great idea.

We challenged 12 of the most revered security specialists to provide us with their most comprehensive suites, to see who comes out on top, both in terms of total protection and in the extras they can throw in for a reasonable price.

Our group test looks at how effectively these tools can protect your machine but also focuses on how easy they are to use, how efficiently they integrate the various components and how well they achieve the goal of being a complete security solution for the home user.



AVG Internet Security 8

Price £39.99 **Contact** AVG 0844 894 1000 www.avg.com/uk.homepage



AVG was made popular through its success as one of the most effective free virus scanners around, but these days the software aims to be a complete security suite to help protect you against the latest threats.

AVG 8 is the newest version and offers protection against viruses, spyware, spam and phishing, provides identity and intrusion protection, has a web link scanner, and supplies the system firewall.

Although the user interface gives the impression of a package with a wide range of features there's actually not a lot to the AVG suite aside from system

security. Twelve tool categories are displayed, each with a reassuring green tick alongside to let you know that the component is active and up to date, but the majority of the tools seem to have little purpose. If you double-click on most of the tools you're simply given information on the current version, or in some cases are allowed to tweak the behaviour of the components via a handful of tickboxes.

Tools such as Firewall offer more control, but they are rather confusing to manage because of the way in which AVG configures profiles for your computer. The approach obviously has its advantages but beginners may find it difficult to manage, and it doesn't help that the rest of the options for fine-tuning components are stored in an advanced settings menu accessible through dropdown boxes.

AVG also takes quite a long time to scan through a system's files, even in its fast mode, uses a lot of processes and system memory, and doesn't really give the overall impression of a well-integrated collection of security tools.

While there's a good degree of control over settings offered here, most people would probably prefer a start-and-forget solution. And while AVG's standalone anti-virus software is undoubtedly still appealing, the internet security angle doesn't fare quite so well.

Verdict

Pros Effective enough scanning tools; protects against most current security threats; reasonably priced

Cons Lack of extra features; advanced settings awkward to manage; rather slow

Overall AVG is certainly capable, but with so many suites performing so well in this group test it can't really claim to be up there with the more impressive solutions

Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★★
Overall	★★★★★

Bitdefender Total Security 2009

Price £44.95 **Contact** Bitdefender 08451 305 096 www.bitdefender.co.uk



Bitdefender has been in and around the top few security suites for the past few years, but has tended to stop short of offering something that elevates it above the competition.

The Total Security 2009 suite introduces online storage, instant message encryption and a file vault. The new features sit on top of a wealth of tools that can make security almost seem secondary.

As you can see from the features table on page 104, the suite ticks just about all the boxes in terms of protection and security, adding backups, Wifi monitoring, Registry cleaning, a defragmenter and

parental control. It will also monitor Microsoft and application updates to let you know when software needs a refresh, and allows you to manage all of this from within the suite.

This comprehensive range of features is expertly controlled through either a 'basic' or 'advanced' interface. The Basic view uses a combination of tickboxes and one-click solutions to let you choose which areas of your computer to monitor and therefore what should be fixed when problems arise. The Advanced view takes a more traditional approach by separating tools into their component parts: they are easily accessible and offer a nice degree of control, with a combination of sliders and tickboxes to adjust the level of security.

We were particularly impressed by how Bitdefender assembles this massive range of features in such a usable manner, especially when you consider the fast scan times, streamlined operation, low system overheads and comprehensive protection.

Bitdefender snaps at the heels of industry leaders such as Kaspersky and Zone Alarm when it comes to anti-virus/malware and firewall protection. Certainly, its shortcomings are not serious enough to undermine a suite that is the most comprehensive on test in terms of protection and extras at a very good price.



Verdict

Pros Wide array of well-integrated features; impressive protection; fast and easy to use; great value

Cons Protection isn't quite industry-leading

Overall If you're concerned about the most comprehensive protection available, then Bitdefender falls a shade short, but it's at the top of the pile when it comes to all-in-one security solutions

Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★★
Overall	★★★★★

Bullguard Internet Security 8.5

Price £44.99 Contact Bullguard www.bullguard.com



Bullguard is the only suite here that hasn't 'officially' been released in a new version for 2009. The software on test is the recently announced version 8.5, which doesn't offer any new features but does make improvements to security, such as increased rootkit and phishing detection, a faster firewall architecture and two-hour security updates. This upgrade just brings the suite into line with current rivals although existing Bullguard users will be pleased to hear they will be automatically upgraded, provided their subscription is still active.

The tidy interface splits tools into categories and

offers an array of helpful information on the main page. You're informed of recommended actions such as running a disk scan, performing an update or configuring backups to help ensure that you're making full use of the software. A comprehensive summary is also offered, detailing the state and recent activity of each component.

Bullguard's scanning engine is very effective and offers a choice of resolutions depending on the threat. The program constantly turns up the heat by trying ever more drastic solutions until it discovers the best way of removing a threat. If all else fails, it reports the problem to Bullguard's tech support department and they email you with a solution; in our test this arrived in less than 24 hours and proved very helpful.

The firewall is pretty intuitive and offers beginner and advanced views to simplify things for less experienced users. The 5GB of online backup storage included with the basic package makes for a comprehensive security solution.

It's fast and easy to use and had very little impact on system performance during our tests. The lack of established certification may be a concern for some, but this shouldn't put off anyone looking for a tidy all-in-one solution that can handle all security and backup needs quickly and efficiently.

Verdict

Pros Wide range of features; generous online storage; fast, effective scanning; easy to use

Cons Lack of recognised certification is a shame; no tune-up tools

Overall No major changes in version 8.5 but Bullguard remains a comprehensive all-in-one solution that gives peace of mind

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

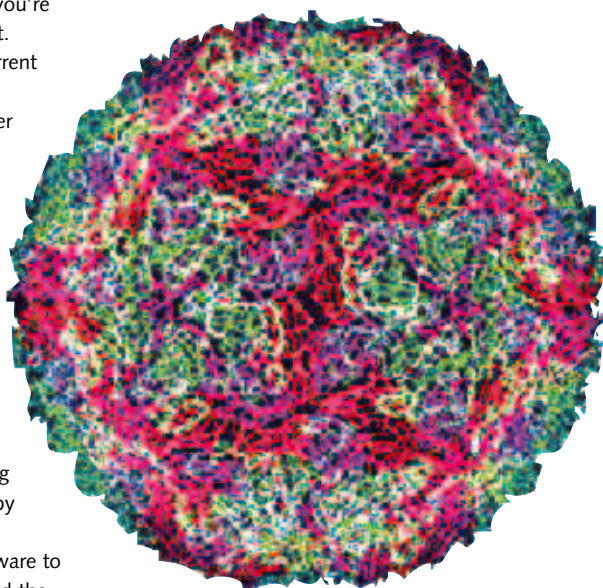
The changing face of viruses

The increasing importance of technology in our day-to-day lives means that it's more essential than ever to take system security seriously and make sure you're adequately protected and aware of the different types of threats that exist.

A recent study by Symantec revealed that the number of threats in current circulation is at an all-time high, topping the one million mark. Almost 500,000 new threats were detected in the second half of 2007, up 136 per cent from the first half of the year, and the vendor is currently detecting as many as 8,000 new pieces of malware every day. Emerging threats such as phishing – the act of trying to procure an individual's personal or financial details through fake emails – and concerns that smartphones and other mobile devices will be the next target for hackers and malicious code all suggest that we should be more concerned about security than ever.

There's a reason we haven't seen as many high-profile virus attacks reported in the news, though. On the whole, it's down to security vendors staying one step ahead of threats and constantly updating their software to offer the latest protection. According to most experts, once you have introduced dedicated tools such as anti-phishing, online scanning and identity protection, the most effective way to combat new threats is by keeping your system up to date.

Some vendors have even built Windows Update checks into their software to alert users to the availability of new security fixes, and most have increased the frequency of online updates of virus and malware signatures. A decent security suite with a firewall and other forms of threat detection is a must for any home user, but as ever it's just as important to remain vigilant and wary of suspicious-looking programs, emails and attempts to access your computer or mobile device.



A constant stream of new and mutant viruses pollutes the internet and makes a decent security suite essential

F-Secure Internet Security 2009

Price £39.95 **Contact** F-Secure www.f-secure.co.uk



F-Secure's Internet Security 2009 is a straightforward security solution in that it doesn't offer any additional features for tune-up, optimisation or backup. It's particularly capable at eliminating threats, though, and was the only software here to score higher than Kaspersky in Virus Bulletin's spyware and malware lab tests.

Unfortunately, its bare-bones efficiency doesn't make for a particularly friendly suite. The interface is overly basic, in most cases adopting a list view for access to the various components. While the desired degree of control over the firewall and scanning

features is here, beginners may find the layout awkward to browse. The rather untidy approach carries through to OS integration: the software pollutes your system with 17 individual background processes and is especially resource-hungry during scans, rendering our test computer all but unusable during this time.

Other minor glitches proved annoying, such as the status warning on the main overview tab telling us our virus definitions were 'very old' in scary red lettering at the same time as saying the software was bang up to date. There's no one-click fix associated with these warnings, either, leaving you to root around to find and fix the cause of the problem yourself.

Despite the unfriendly approach we did find the parental controls to be very good, with wizard-based setup to configure different age groups and good protection against unsuitable content. This is clearly an area that F-Secure takes seriously but the sometimes awkward operation doesn't back up its billing as a family-friendly solution.

The software also lacks extras such as Wifi support and a gaming mode and, while it should be commended for its excellent malware scanning results there's not enough here to outweigh the extra features and more usable approach to configuration adopted by many of its rivals.

Verdict

Pros Top-ranked anti-malware scanning; good parental controls

Cons Resource-hungry; untidy install; lack of extras; slow scans

Overall Not nearly enough here in terms of extra features, usability and performance to back up some impressive scan results from the rather lightweight F-Secure suite

Features ★★★★★

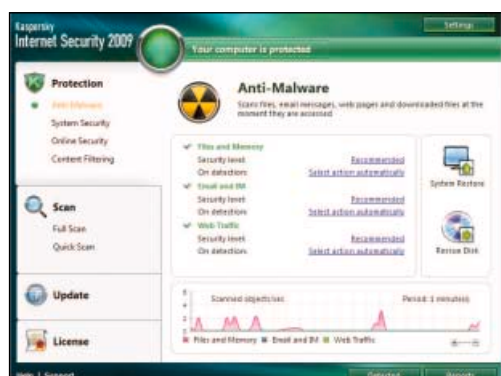
Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Kaspersky Internet Security 2009

Price £39.99 **Contact** Kaspersky 0871 789 1632 www.kaspersky.com



Kaspersky's Internet Suite 2009 adds some interesting new features to an already comprehensive security package to heighten its appeal further. As well as application management and wireless security, it offers vulnerability scanning and a virtual keyboard for safe entry of logins and passwords. Together with an impressive degree of protection against traditional threats, it makes for an appealing solution that is tied together extremely well through the straightforward interface.

Beginners will appreciate the one-click 'Fix-it' solution that walks you through correcting any

vulnerabilities detected on your system.

You can also manually skip through the anti-malware, system security, online security and content filtering tools to adjust general settings for each, and access useful tools such as a rescue-disk builder, system restore and network monitor.

There's a wide array of advanced options for fine-tuning every aspect of the software, along with an excellent degree of logging and history to help track threats and view statistics.

We were very impressed by this three-tiered approach to operation, which carries through to the scanning tools, where you have the option of picking and choosing the elements of your PC to include.

Kaspersky's anti-virus engine is renowned, so it's no surprise that it scored extremely highly in Virus Bulletin's latest lab results, with 98.4 per cent success against malware and 98.3 per cent against spyware, making it a formidable guard against recent threats. When you tie this in with negligible impact on system performance you are looking at an extremely impressive security solution.

If you're not bothered about additional backup and optimisation tools, Kaspersky provides the best combination of control, comprehensive security and system monitoring on test.



Verdict

Pros Excellent anti-virus and malware protection; well-integrated features; easy to configure and use

Cons Lacks a few extras

Overall Kaspersky just trumps Zone Alarm as the 'security only' suite of choice through usability and collection of genuinely useful extra features

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

McAfee Total Protection 2009

Price £59.99 **Contact** McAfee 01753 217 500 www.mcafee.com/uk



McAfee has been one of the leading names in home security almost since viruses first appeared, but recent versions of its suites have suggested that it may be falling behind a crowd of worthy competitors.

Total Protection 2009 offers McAfee's SiteAdvisor tool to help protect against potentially malicious websites and now includes links on IM messages and emails. There's also improved network protection, but in truth there aren't a lot of other new features here and it doesn't seem worth an upgrade.

In terms of protection it's still comprehensive but

while there is a wide array of tools and additional features available, we weren't very impressed by how well the interface pulls everything together.

A one-click solution helps to keep everything tidy but most of the individual tools are collected in a list view with an on and off selection and advanced rules access where necessary. The sheer number of components that are individually accessible is likely to prove daunting to most users and, while there is a basic view that attempts to simplify things, it doesn't do a particularly good job.

In addition to protection, McAfee bundles its Backup and Restore application, which is accessible from the main menu but loaded in a separate window. This again appears to be unnecessarily complicated and with no online drive available you're limited to local or networked storage for your backups. Elsewhere QuickClean offers PC maintenance to scan for unnecessary files or Registry entries.

While the software is adept at scanning for and removing threats, it's also resource-hungry and isn't a particularly tidy install. You're also paying quite a lot for the range of tools available; while the same can be said of its old nemesis Norton, the latter is more usable and streamlined and does a better job of offering peace of mind that your system is secure.

Verdict

Pros Range of tools available; improved SiteAdvisor protects you while online; one-click fixes
Cons Interface feels bloated and is awkward to use; resource-hungry and sluggish in operation

Overall A comprehensive suite that suffers from the interface clutter and performance issues

Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★★
Overall	★★★★★

Microsoft Windows Live Onecare

Price £37.99 **Contact** Microsoft 0871 789 1632 www.onecarelive.com



Windows Live Onecare hasn't fared so well against more established anti-virus/malware vendors in the past, but Microsoft keeps ploughing on to offer Windows users a well-integrated solution.

It now boasts some impressive certification and adds scheduled backups, virus and malware scanning, and a slightly more powerful firewall that adds wireless monitoring to Windows' default tools. But it's not sufficient to elevate it above rivals.

Once installation is complete you'll see a new icon on the system tray that changes colour from red to

orange to green depending on the current state of your system. You can access the main interface from here to correct faults. A series of alerts pop up to remind you to update applications or definitions, run backups and scan your machine. Underneath is information on recent scan and update activity with corresponding links to scan your machine and configure backups. You'll also find a range of tune-up tools here that'll remove unnecessary files and defragment the hard drive. Since it also includes virus scanning and backup, it's effectively a 'one-click' solution.

One tool that you won't find bundled with Windows is Live Onecare's Startup Manager, which allows you to turn off software that automatically starts with your machine. However, the list here seems rather selective and doesn't have anything like the amount of flexibility you'd expect.

Onecare's scanning tools do a decent enough job but the firewall is a bit below par, which may leave you cleaning up threats that should have been blocked in the first place. You can add online storage to the default backup features for an additional fee, but most will find that lengthy scan times and heavy memory usage mean the suite doesn't offer nearly the degree of security or peace of mind you get with some of the others on test.

Verdict

Pros Improved anti-virus and malware protection; integrates well with Windows

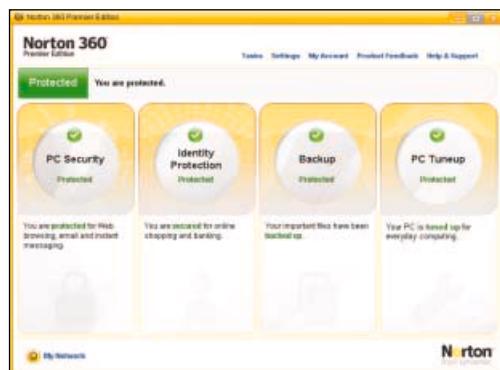
Cons Infrequent updates; limited additional features; lengthy scans

Overall May be capable enough in its own right, but Windows Live Onecare still doesn't offer nearly enough compared with the other suites on test

Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★★
Overall	★★★★★

Norton 360 v2

Price £59.99 **Contact** Symantec 0800 331 6025 www.symantec.co.uk



Norton 360 was one of the first security suites to incorporate additional features to help you back up and optimise your computer, so the application is particularly fitting for this group test. Version 2 of 360 is the newest release and offers users improved performance, identity protection and automatic form filling, browser protection and Registry clean-up.

The additions and improvements complement an already impressive range of features that include file clean-up, a disk defragmenter, system diagnostics and 2GB of online storage.

All of this is very well organised in the main interface and, while the software takes quite some time to install, set up and update we were impressed by how quick and easy it was to browse the features on offer and to complete scans and backups.

Norton approaches the scanning process in a different way to most of its rivals. Although it offers a quick-scan option, full scans are mixed in with a range of other checks designed to hunt down system vulnerabilities, perform backups and clean up disks. There is also a custom option so that you can pick and choose exactly what you want to run, to save time or address faults directly.

Behind the main interface is an array of key functions accessed by clicking the appropriate category, and you'll find all the other tasks and settings accessed through what is best described as a list format that isn't particularly friendly. Although there are plenty of options provided for adjusting the various levels of security, some of the areas may prove rather daunting for beginners.

Norton 360 is a very capable security suite and up there with the best on offer in terms of features and support. Unfortunately, it's also rather more expensive, which may put some people off in the light of some very capable alternatives.



Verdict

Pros Fast, effective scans; comprehensive security; range of extra features

Cons Expensive; advanced settings can be awkward to browse

Overall 360 maintains its reputation with the new version and, despite the high price, is still an extremely capable way of securing your PC and backing up data

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Panda Global Protection 2009

Price £48.99 **Contact** Panda 0870 243 0690 www.pandasecurity.com/uk



We've been quite impressed by Panda's software in the past and chose its Global Protection 2009 for this group test as a worthy competitor to security suites like Norton 360 and Bitdefender.

It's certainly a full-featured package, adding online backup and optimisation tools to an already comprehensive suite of software. The interface is quite straightforward and alerts you straight away if there are any issues affecting your system. Tools are split into protection, maintenance and update categories, with the bulk of the software falling into the first

category with anti-virus, firewall, identity protection, vulnerability and spam filters.

Each of these is highly configurable but Panda somehow manages to organise the available settings very well. The firewall in particular is very easy to configure by means of a series of basic forms; while it doesn't look particularly good, each form is easy to understand and that should suit beginners.

The rest of the suite adopts a similar style and you'll find good control over system backups, although we were a little disappointed by the basic approach taken to PC optimisation and clean-up.

System scanning isn't particularly intuitive since there are no quick/normal/full options here; instead, you're given a choice to scan the entire computer, hard drive, mail or specific file types. While the settings menu offers a bit more control, we much prefer the straightforward approach taken by others.

We were also rather frustrated by the slew of processes it runs during operation, with no fewer than 10 taking up a decent chunk of your system memory. While Panda manages these well enough not to affect system performance too drastically, it doesn't seem nearly as streamlined as some of the other suites and the rather basic approach taken to the additional tools on offer leaves it somewhat lacking.

Verdict

Pros Effective virus and malware protection; range of extra features; well-organised interface

Cons 'Extras' on offer appear basic; can be awkward to configure

Overall The comprehensive nature of Panda's security is impressive but it doesn't have quite enough to usurp rivals as either a dedicated security solution or an all-in-one suite

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

PC Tools Internet Security 2009

Price £49.95 Contact PC Tools www.pctools.com



PC Tools' Internet Security 2009 is the full-blown version of its successful anti-virus and anti-spyware suite. It adds a firewall and anti-spam features and comes with the Intelliguard engine to protect against online threats.

The interface hasn't changed for a while and consists of a main status page updating you on anti-spyware, anti-virus, anti-spam and firewall tools, alongside general protection information.

Controls on the left allow you to start a quick, full or custom scan and the Intelliguard suite offers access to tools such as a browser, cookie, email, file and

network guards. Each of these simply offers an enable/disable control, activity log and the ability to manage exclusions.

The rest of the software is controlled through the settings menu. However, the majority of the settings are overly simplistic, consisting of a series of tickboxes that enable or disable the various components of the suite. The firewall offers rather more control, but also suffers from one of the biggest issues we have with the software.

PC Tools has kept the same interface and essentially crammed the extra tools in. Everything seems far too convoluted and the applications within the suite don't really have room to breathe.

The good news is that from an anti-virus and malware point of view, PC Tools appears to be very effective. It's very capable of picking up and removing the latest threats and safeguarding your machine against intrusion, but these days that doesn't seem quite enough.

When you consider how few additional tools there are available in comparison with many of the other suites on test here, it doesn't seem as though PC Tools has made nearly enough effort with the additional forms of security on offer to improve on its excellent standalone anti-virus/spyware package.

Verdict

Pros Anti-virus/malware engine still very effective; fast and easy to use
Cons Can be very difficult to configure; convoluted interface; not many extras

Overall Although the PC Tools scanning engine is very efficient at eliminating threats this really isn't enough for an internet security suite

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Certification bodies offer seal of security approval

The ever changing face of viruses and new malware threats makes it impractical to thoroughly test the efficiency of security suites and their ability to guard against and remove threats in our labs. Instead, we rely on a number of professional bodies that exist just for this purpose, with certification awarded to the most successful software, as outlined in the features table (see page 104).

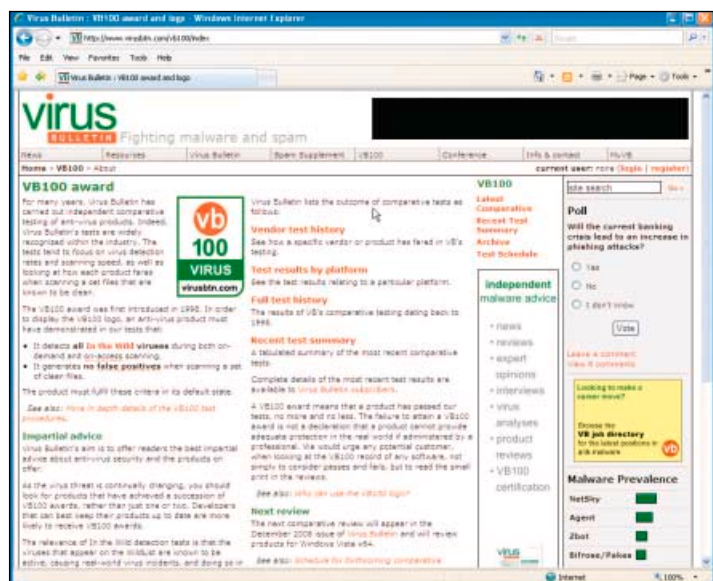
The ICSA is an independent organisation that has set criteria for certifying anti-virus software and currently covers over 95 per cent of the security products in the world today.

Virus Bulletin offers its VB100 award to anti-virus engines that can detect all currently known active viruses both when files are received or accessed and when a manual scan is run, generating no false positives in the process.

Similarly, WCL Level 1 & 2 certified software is able to detect all current active viruses without false positives, as well as preventing a virus from replicating.

The majority of the suites in this group test had at least one of these four certifications, with a surprising amount doing well enough to pick up multiple awards.

Most security software vendors now offer their products for test. While not all manage to pass, this doesn't mean that the software is inherently dangerous or that you're running the risk of allowing threats to affect your machine by using them, since testing criteria in most cases are very strict. Certification does offer extra peace of mind for most users, though, and new versions are



VB100 is awarded only for no false positives and a perfect detection score

frequently tested on multiple platforms to generate accurate results.

You can view recent tests and find out why specific software may have failed by visiting the official websites of these various bodies.

Trend Micro Internet Security Pro 2009

Price £54.95 **Contact** Trend Micro 01628 400 500 <http://uk.trendmicro.com/uk/home>



Trend Micro's Internet Security Pro 2009 is a rebranded PC-Cillin and attempts to compete with rivals in today's market by offering a tidy interface and a number of interesting features.

There is a wide range of tools crammed into this suite but everything is well organised through a category view that lets you enable, disable and adjust settings through a combination of sliders, tickboxes and dropdown lists. It's easy to find your way around and we were impressed by how straightforward the software is at allowing you to tweak advanced settings for areas such as the firewall and online threat protection.

Overall, there's a very comprehensive range of security here, and the Pro version on test offers a number of extras, such as a graphical activity log and a toolbar that alerts you to potentially dangerous web pages over a local or wireless connection. There's also a system tuner to improve performance that will scan your Registry, startup and internet settings for errors, and a remote file lock that creates a password-protected vault for sensitive data.

Trend Micro also lauds its ability to protect your smartphone or PDA against threats by downloading additional software designed for this purpose, something that's included as one of your three computer licences on purchase.

The software performs well in terms of protecting you against harmful activity and detecting and removing it, but a ton of resources is used up in doing so. While the quick scan wasn't overly intrusive, the full scan left the computer at best sluggish and at worst unusable, and by loading a total of 12 processes it's hardly the tidiest solution on the market.

Despite a comprehensive range of protection and some handy extra tools, Trend Micro's offering is a bit of a resource hog. Such is the high quality of the competition elsewhere that its faults prevent it from standing out from the crowd.

Verdict

Pros Well organised and easy to use; handy extra tools

Cons Very resource-hungry; rather expensive

Overall Adept at protecting you against threats and an approachable solution for beginners, but the price and large system footprint stop Trend Micro scoring higher

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Zone Alarm Internet Security Suite 2009

Price £39.95 **Contact** Zone Alarm www.zonealarm.com



Zone Alarm likes to remind people that it pioneered the first personal computer firewall, but it has had its work cut out since keeping abreast of a range of worthy competitors.

The main change to the 2009 version of its Internet Security Suite is a revised and modernised interface, which is a timely boost, considering the original was starting to look a bit dated. It takes a tidy approach to the category layout and a new Fix It function on the main page offers a one-click solution to common problems.

Delve a bit deeper, though, and it becomes

apparent that the suite is still using the tried and trusted slider-based approach to adjusting security levels, with plenty of custom options available and enough advanced settings to offer an excellent degree of control.

Hourly updates offer peace of mind. There are parental controls to protect against unsuitable content, and both on and offline identity protection services to guard against fraud. It does lack some features, though, such as anti-phishing protection, which it has reserved for the separate Forcefield product.

Zone Alarm makes no bones about the fact that it is solely focused on security, and while the suite's capabilities are very solid in this regard there isn't anything here in terms of system backup, tune-up or additional tools. Considering what some of the competition is offering, we'd have liked to see it include a few new features in this version.

The suite is very light on system resources and had no impact on performance while scanning, although scan times are a little laboured. When you add in the fact that the watertight firewall is still industry-leading and that it has now wisely chosen to use Kaspersky's similarly respected virus protection, Zone Alarm's new suite is up there with the most effective security solutions available.

Verdict

Pros Excellent firewall and anti-virus protection; little impact on system performance; tidy new interface

Cons Lacks some of the extras on offer from rivals

Overall Zone Alarm performed exceptionally well as a security solution but doesn't offer quite the range of extras available elsewhere

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★



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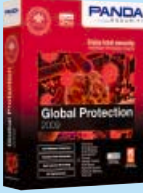
A New Way To Think Smart



Antivirus + Antispyware + Antispam + Personal Firewall

Security suites

					
MANUFACTURER	AVG	BITDEFENDER	BULLGUARD	F-SECURE	KASPERSKY
Model name	Internet Security 8	Total Security 2009	Internet Security 8.5	Internet Security 2009	Internet Security 2009
Price	£39.99	£44.95	£44.99	£39.95	£39.99
Sales telephone	0844 894 1000	08451 305 096	N/A	N/A	0871 789 1632
URL	www.avg.com/uk.homepage	www.bitdefender.co.uk	www.bullguard.com	www.f-secure.co.uk	www.kaspersky.com
SPECIFICATIONS					
Number of licences included	1	3	3	3	1
Anti-virus	✓	✓	✓	✓	✓
Anti-spyware	✓	✓	✓	✓	✓
Anti-phishing (web)	✓	✓	✓	✓	✓
Anti-phishing (email)	✓	✓	✓	✓	✓
Anti-spam	✓	✓	✓	✓	✓
Parental controls	✗	✓	✗	✓	✓
Identity protection	✓	✓	✓	✓	✓
Intrusion detection	✓	✓	✓	✓	✓
Standard subscription	1 year	1 year	1 year	1 year	1 year
Update frequency	4 hours	Hourly	2 hours	2 hours	Hourly
Scheduled scans	✓	✓	✓	✓	✓
Heuristic scanning	✓	✓	✓	✓	✓
Scan engine certification	ICSA, VB100, WCL-level1, WCL-level2	ICSA, WCL-level1, WCL-level2	None	VB100, WCL-level1, WCL-level2	ICSA, VB100, WCL-level1, WCL-level2
Free 24/7 live online technical support	✗	✓	✓	✗	✓
UK phone support	✗	✓	✗	✓	✓
OTHER FEATURES					
Automatic program control	✓	✓	✓	✓	✓
File backup facilities	✗	✓	✓	✗	✗
Online backup	✗	✓ (2GB)	✓ (5GB)	✗	✗
PC tune-up facilities	✗	✓	✗	✗	✗
Quarantine	✓	✓	✓	✓	✓
Gaming mode	✓	✓	✗	✗	✗
Recovery CD	✗	✓	✗	✗	✓
Wifi monitoring	✓	✓	✗	✗	✓
Password protection for settings	✗	✓	✗	✗	✓
Disk defragmenter	✗	✓	✗	✗	✗
Secure delete	✗	✓	✗	✗	✗
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

							
	MCAFFEE	MICROSOFT	NORTON	PANDA	PC TOOLS	TREND MICRO	ZONE ALARM
	Total Protection 2009	Windows Live Onecare	360 v2	Global Protection 2009	Internet Security 2009	Internet Security Pro 2009	Internet Security Suite 2009
	£59.99	£37.99	£59.99	£48.99	£49.95	£54.95	£39.95
	01753 217 500	0871 789 1632	0800 331 6025	0870 243 0690	N/A	01628 400 500	N/A
	www.mcafee.com/uk	http://onecarelive.com	www.symantec.co.uk	www.pandasecurity.com/uk	www.pctools.com	http://uk.trendmicro.com/uk/home	www.zonealarm.com
	3	3	3	3	3	3	3
	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓
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	✓	✓	✓	✓	✓	✓	✓
	✓	✗	✓	✓	✓	✓	✓
	1 year	1 year	1 year	1 year	1 year	1 year	1 year
	Hourly	Daily	4 hours	2 hours	2 hours	4 hours	Hourly
	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓
	ICSA, VB100, WCL-level1, WCL-level2	ICSA, VB100, WCL-level1, WCL-level2	ICSA, VB100, WCL-level1, WCL-level2	ICSA, WCL-level1, WCL-level2	ICSA, VB100	ICSA, WCL-level1, WCL-level2	VB100, WCL-level1, WCL-level2
	✓	✓	✓	✗	✗	✗	✓
	✓	✓	✓	✗	✗	✓	✗
	✓	✓	✓	✓	✓	✓	✓
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	✗	✗	✓ (2GB)	✓ (2GB)	✗	✗	✗
	✓	✓	✓	✓	✓	✓	✓
	✓	✗	✓	✗	✗	✗	✓
	✗	✗	✗	✓	✗	✗	✗
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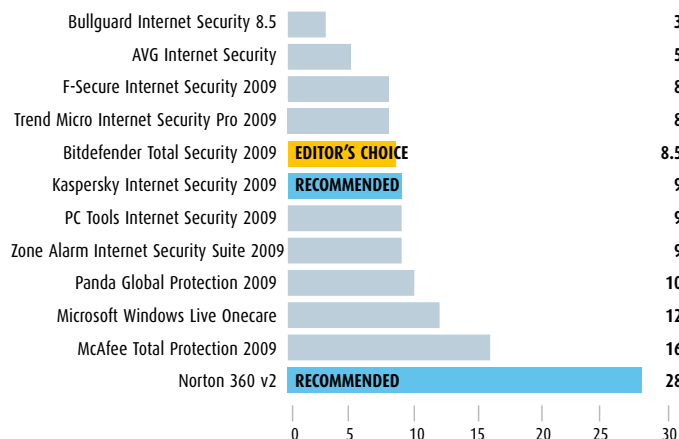


Lab results

Bitdefender consistently recorded some of the fastest scanning times and lowest CPU and memory usage scores among the security suites on test

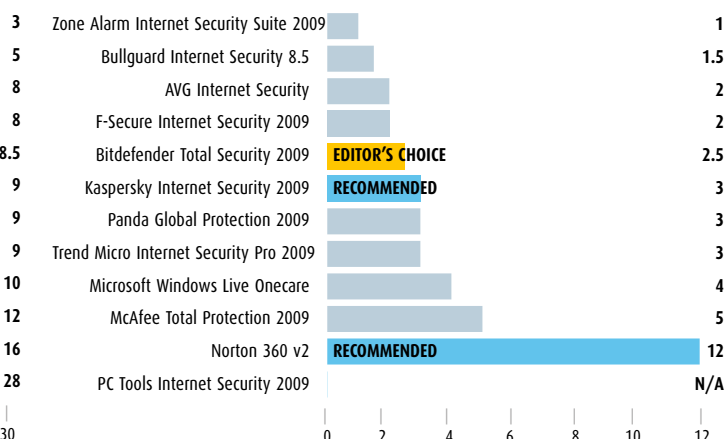
Total time for install (including update) in minutes

Smaller is better



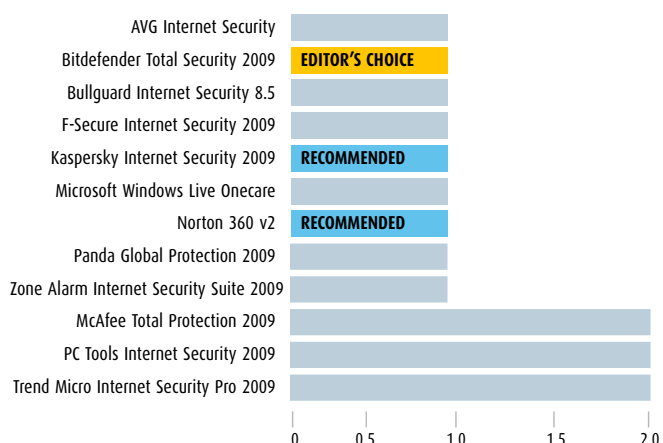
Online update time in minutes

Smaller is better



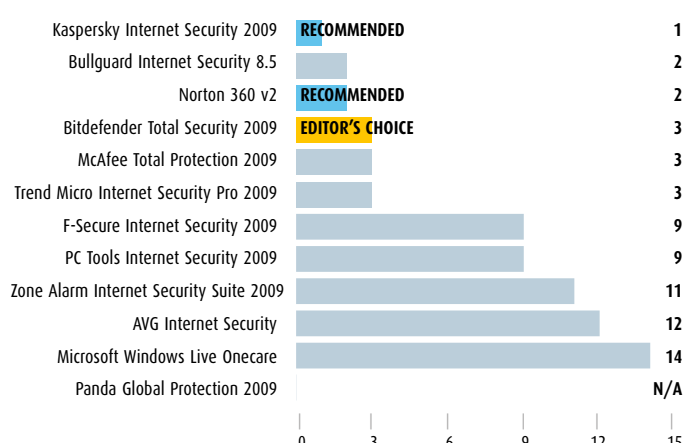
Idle CPU usage (per cent)

Smaller is better



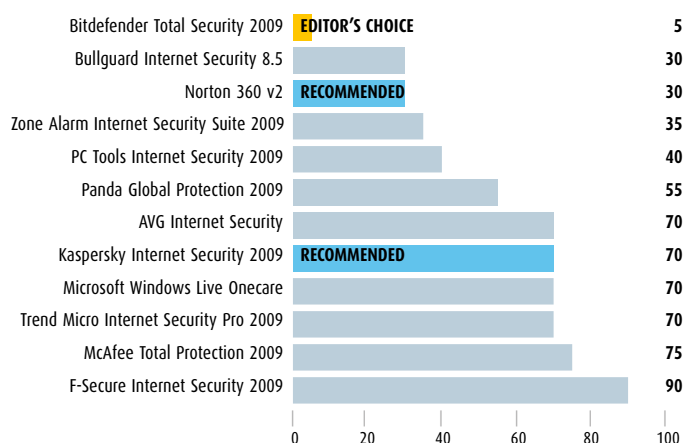
Time for quick scan in minutes

Smaller is better



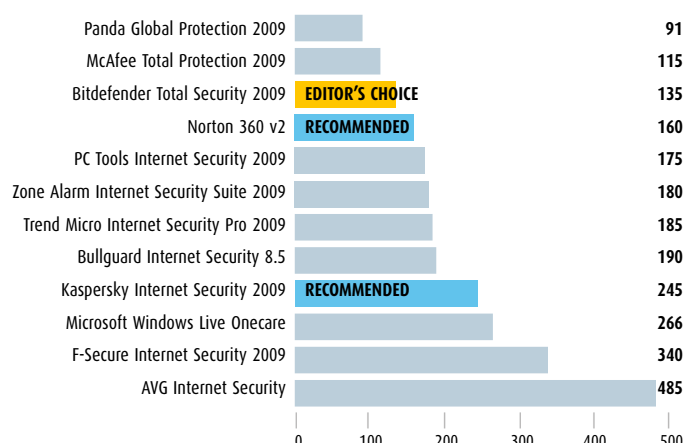
Quick scan CPU usage (average) (per cent)

Smaller is better

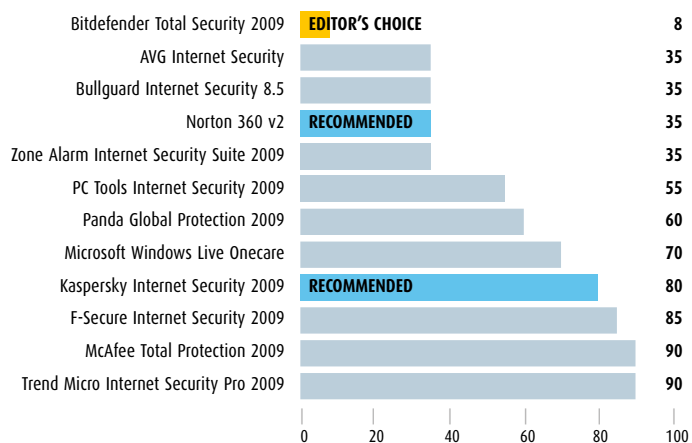


Time for full scan in minutes

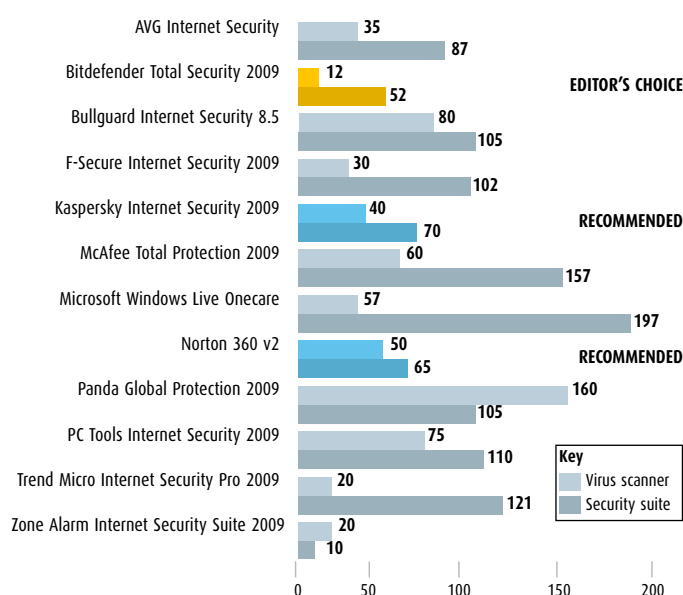
Smaller is better



Full scan CPU usage (average) (per cent)



Memory usage (MB)



Editor's Choice

Editor's Choice Bitdefender Total Security 2009

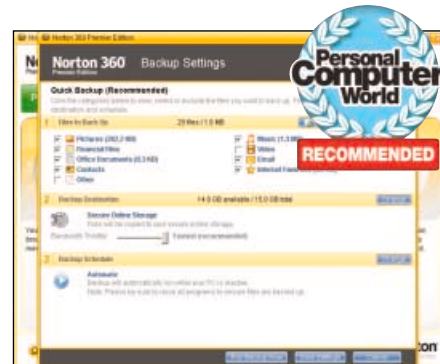
Recommended Kaspersky Internet Security 2009 • Norton 360 v2



Bitdefender Total Security 2009



Kaspersky Internet Security 2009



Norton 360 v2

We were surprised at how well most products fared in the comprehensive protection stakes for 2009, which just goes to show how seriously these established names are taking home security. Even though some suites clearly made or kept their reputations as the best of the bunch in various fields, most were extremely capable and we found ourselves spending more time judging ease of use and the extras on offer. With such a high standard among so many products, we judged that accessibility and straightforward operation were as important as effective security, and here there was much more variation in the capabilities of the different packages.

Special mention, and the first of our Recommended awards, goes to Kaspersky for tying genuinely useful additions to industry-

defining protection. Zone Alarm deserves recognition for its consistently excellent firewall, which uses Kaspersky's threat protection to come up with a formidable security solution, but it just misses out on an award this time.

Bullguard and Norton 360 were pretty much tied in the all-in-one stakes, with the latter edging ahead for its industry-recognised certification and gaining the second of our Recommended awards.

The real winner is a vendor that has threatened for years without really delivering a total package. Bitdefender truly impressed in this group test, and partly for the reasons highlighted above walks away with our Editor's Choice award. Although it isn't quite as good as Zone Alarm at preventing threats from affecting your PC, or as effective as Kaspersky at

scrubbing them away, it wasn't far behind either and the advantages it offers over these rivals give it a distinct edge.

We were impressed not only by the wide range of extra features on offer in Bitdefender but also at how well they were integrated into a basic interface that makes it easy for beginners to protect, optimise and update every area of their computer. With enough flexibility here for advanced users, speedy scans and a small system footprint, there could only be one winner in a hard-fought contest. Though some may laud the benefits of our Recommended choices for different reasons, Bitdefender receives the top prize here for its range of features, speed and user-friendly approach, making it our pick for the most comprehensive all-round security solution for the home user. **PCW**

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AVERTING DISASTER

There's a lot happening in the storage market these days, with virtualisation one of the big talking points as far as large networks are concerned. When it comes to humbler setups, however, backup and disaster recovery are firmly centre stage, so we're kicking off this month's Business section with a look at some of the backup technologies and products showcased at the recent Storage Expo exhibition.

As well as our backup feature we've the usual clutch of reviews. Not least is a security computer on a card from Yoggie, designed for notebooks, plus the latest in multifunction printers based on the HP Colour Laserjet engine. A small but capable Canon desktop scanner completes the hardware, while Teamviewer, an easy-to-use remote control application, and Citrix's Xenserver 5 hypervisor make up the software.

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116 Citrix Xenserver 5



OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.

Recommended: A product that combines great features, usability and value for money.

Great Value: Not the best in class, but a product that has superior features and performance for the price.



Editor's Choice
Business



Recommended
Business



Great Value
Business

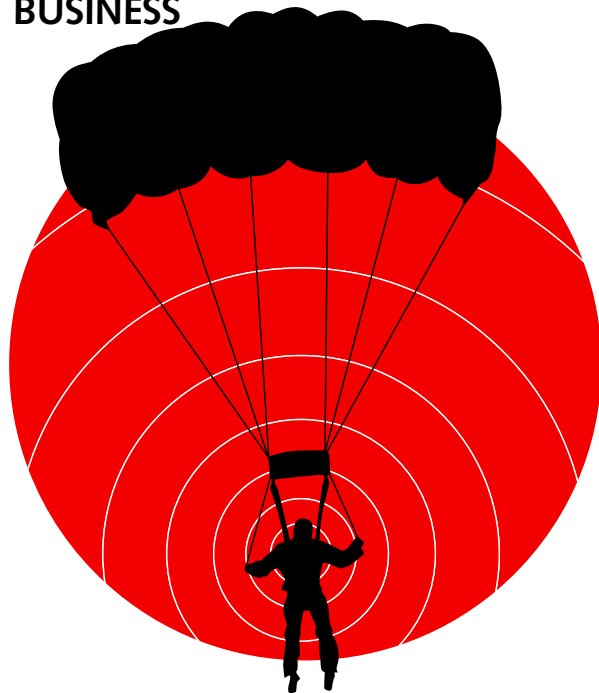
The business awards are used for products that are more suited to home offices or small businesses.

BUSINESS



'The HP CM2320fxi is a quality product and a lot more than just another printer with a scanner on top'

Read the review on page 113



Back up to backup

The latest technologies make it easier and cheaper than ever for your business to back up its critical data. Alan Stevens investigates

There was plenty to see at the busy Storage Expo at London Olympia last October, with backup and disaster recovery, the long-time Cinderella of the storage family, firmly back as the belle of the ball.

With that in mind, this month's feature is all about the world of small-business backup. We'll be looking at the new technologies and products on offer, and what kind of impact they're likely to have when it comes to protecting your data.

Tape is dead

One very clear and very loud message from Storage Expo was that tape, as a backup medium, is now well past its sell-by date. At least it is as far as small-business solutions are concerned. Tape still has a role to play in enterprise solutions but, much like audio cassettes and VHS video, backup tapes and tape drives have been eclipsed by disk-based solutions. It's good news for small businesses, though, as they're quicker, a lot more convenient and cheaper too.

Tape drives have always been expensive. Prices typically run into hundreds of pounds and they sometimes cost as much again as the server to which they're attached. That's enough to put off a lot of buyers, which is exactly what tended to happen, pushing backup well down the priority list.

The ready availability of affordable high-capacity hard disks has changed all that. All that a lot of small businesses now need to protect their servers is an external drive to copy data to. Moreover, there's plenty of choice and they're ridiculously cheap. External disks capable of holding up to 500GB, for example, start at around £60 ex Vat. That's not much more than the cost of a tape cartridge, and there's nothing else to buy.

Most external disks are designed to plug into a free USB port, making them easy to

install, although for maximum performance it's worth seeking out drives with an eSata (external Sata) interface. That's because with USB2 you're still limited to 480Mbps/sec whereas with eSata data can be transferred backwards and forwards at up to 3Gbps/sec, the same speed as internal disks. You can even boot from an eSata drive, making it a good choice for disaster recovery.

There were lots of eSata-enabled external disks at Storage Expo, such as the Hypertec Firestorm, reviewed in the June 2008 issue of *PCW*, which comes in a rugged metal casing with one or two disks inside.

Buy an eSata disk like this and all you have to do is plug it into a server and start taking backups. Of course, you'll need software to do that, which we'll cover shortly, but it makes backup a lot simpler. There's no need to remember to put the right tape in the drive every night, or find old backup tapes and wait for them to be searched and rewound to recover deleted files. An external disk is always there, and recovering files takes just a few seconds.

One drawback is the fact that a single backup disk is fixed in size and needs to be

Below: All that's needed to back up a lot of small business servers is an external disk drive, such as this Firestorm, which can hold two Sata drives



left connected to the server. But that's easy to solve. You could, for example, rotate two or three external disks. Alternatively, you could go for a removable disk solution, such as Imation's Odyssey (*PCW* November 2007) or Tandberg's RDX Quikstor (*PCW* May 2007), which was recently updated to take 500GB cartridges.

Available as both internal and external drives, a removable disk is more expensive than a fixed implementation. Expect to pay from £200 ex Vat upwards, depending on capacity. But it does let you swap cartridges as needed (effectively a Sata hard disk in a special carrier) and store backups off site for greater security.

Bigger options

For many small-business servers a single-disk or removable cartridge system is all that's needed, but as the amount of data and the number of servers rise, management becomes an issue. Higher up the scale, therefore, custom disk-based backup appliances are available, with terabytes of data held on multiple servers and workstations. Several were on display at Storage Expo, from vendors such as Quantum (www.quantum.com) and Overland Storage (www.overland.com).



Above: A removable disk solution such as the RDX Quikstor from Tandberg allows you to take multiple disk-based backups and store them off site

The Synology DS508 has Raid support to help recover from disk failure, but you still need to take backups

These self-contained devices have built-in controllers to take backups to multiple-disk drives plus, in some cases, tape and optical drives to provide a second layer of protection.

Whatever solution you go for, don't overlook the need to protect data held on network-attached storage (Nas) appliances as well as ordinary Windows servers. Many of these will have USB or eSata ports to allow external backup drives to be attached and software built in to run scheduled backups.

Others, like the ReadyNAS Duo from Netgear, for example, can also be fitted with a second disk to which everything is mirrored automatically. Multi-disk Raid support is also available in more expensive products, such as the Synology DS508, which we reviewed in October 2008. Raid technology protects against individual disk failure and is worth having. But bear in mind that you still need some kind of backup with both mirrored disks and Raid storage, for example, when you want to recover deleted files or return to an older version of an edited document.

Bear in mind too that Nas appliances can also be used to hold backups from other servers and storage appliances. All the backups are then in one place, although copies do have to be taken over the Lan, which can cause performance issues.

Software needed

One of the big advantages of a Nas appliance, such as those from Netgear, Synology and others, is that backup software will normally be built in as part of the operating system. When it comes to general-purpose servers, however, the decision is not so straightforward. Sure, Windows includes a utility that can be used to take backups, but it's not that flexible and older implementations may well object to copying data to disk rather than tape. As a result you'll probably need a third-party application.

What you choose here will depend, to some extent, on the hardware you go for. A lot of external disks, for example, come with bundled software which, on the face of it, would mean you don't have to buy anything else at all. But that's not always the case, as many such 'freebies' are aimed at desktop users and won't be able to cope with servers or network storage appliances.



And even when they can, you'll often find that you've been given a cut-down or 'lite' implementation requiring a paid-for upgrade to get the full functionality.

Software advances

A lot has been happening to backup software with traditional file-by-file applications such as Backup Exec from Symantec and CA

'Much like audio cassettes and VHS video, backup tapes and tape drives have been eclipsed by disk-based solutions. It's good news for small businesses, though'

Arcserve updated to handle disk-based backup better. These long-established and well-supported products can take backups of web, email and database servers without having to shut them down. However, they can be complicated to use and expensive for the small business to deploy. A simpler and much more affordable solution for those with just one or two servers would be one of the increasingly popular disk-imaging products.

Several of these were demonstrated at Storage Expo, and we've tried and been impressed by some in the past couple of years, including Paragon Drive Backup, which was reviewed a year ago (Winter 2007

issue), and Acronis True Image Echo, which we've tested both for servers (August 2007) and workstations (Christmas 2008).

Disk-imaging tools like these are a lot cheaper to buy into (expect to pay between £100 and £150 to protect a single server), are designed specifically to take backups to disk, and have no problems coping with open files and application servers. Those we've tried have been much easier to use than a traditional file-by-file backup program and are particularly good at recovering crashed servers and bringing them back online as quickly as possible.

Backup to the clouds

One last option, again much in evidence at Storage Expo, is online backup, where backups are taken over the internet to servers hosted by a remote service provider. An increasing number of these services are becoming available although some care is needed as a lot are aimed at home users and don't scale well when it comes to businesses with large volumes of data to protect.

There are security issues to bear in mind too, not to mention how you go about recovering data or even complete systems over a slow internet link.

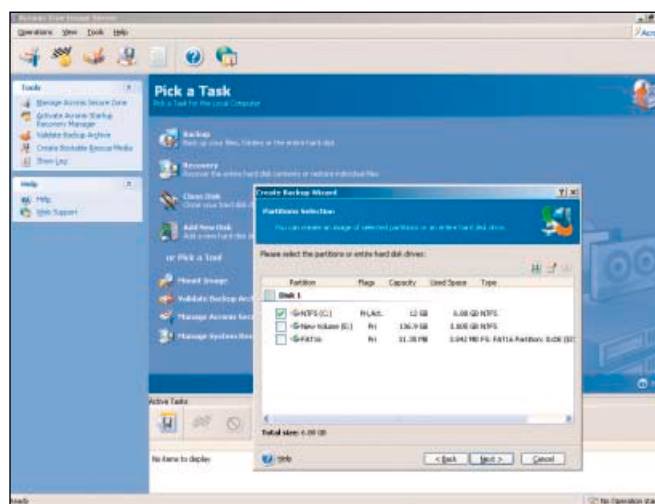
One way around such issues is to look for a provider able to stage backups to managed hardware on the local network before it's uploaded to the remote servers. One of the exhibitors we spoke to, i365 (www.i365.com), is part of Seagate, which offers such a service tailored for small and mid-size businesses.

We were also intrigued by a new product called IDSbox (www.idsbox.eu), a kind of DIY remote backup that lets you take backups to a disk-based appliance on your local network

then replicate the contents of that appliance, over the internet, to another at a remote site.

We're hoping to get hold of IDSbox and other interesting backup products, and we'll tell you what we think about them in future issues. **PCW**

For the small business, disk imaging is a quicker and easier alternative to traditional, file-by-file based backup



SECURITY

Yoggie Gatekeeper Card Pro

Security solution for notebooks aims to do away with software



Yoggie has managed to cram a complete security computer onto a tiny Express Card adapter

The idea behind Yoggie's Gatekeeper Card Pro is to provide notebook users with protection against common security threats without the need for locally installed, hard-to-manage, software tools. However, it's not quite a complete or perfect answer to the mobile security question.

Implemented in the form of a tiny Express Card/34 adapter, the Gatekeeper Card Pro is, in essence, a self-contained security computer, complete with its own processor and Ram, capable of hosting a claimed 13 security applications. A security hardened Linux OS provides the main platform for those applications, hosting a stateful inspection firewall plus tools to scan for a variety of malware including viruses, spam, spyware and phishing attempts. Proxies enable protection to be applied to email (Pop3 and SMTP) and both web (HTTP) and FTP traffic, with URL categorisation and content filtering tools also supplied, together with intrusion detection and prevention utilities. There's even a VPN client, which can be used with a variety of software and hardware-based gateways.

We tried the Gatekeeper Card Pro on a couple of notebooks and it certainly did what was claimed, blocking test viruses and identifying potential spam. It was also almost impossible to bypass, with passwords to stop the supporting software being disabled while, if the card itself was removed, none of the network connections would work until it was replaced. That said, there are a number of limitations to bear in mind.

To start with, the Yoggie adapter can only be used with notebooks equipped with a compatible Express Card slot, although alternative USB products are available for those that don't. You also need to be running a 32-bit version of either Windows XP or

Vista, the setup program modifying any network connections found on the host system to communicate via the Yoggie card rather than directly.

Unfortunately that means that the card can only protect against network-borne threats and, even then, only when using supported protocols. An Eicar AV test virus copied from a USB memory stick, for example, was completely missed, as were those downloaded over an encrypted HTTPS link or attached to messages in an Imap mailbox. Additional security tools are, therefore, still required for complete protection.

One other issue arose when bringing our notebooks out of hibernation, the Yoggie card taking a couple of minutes to "wake up" before we could use the network connections again. The anti-spam protection was also basic, with no blocking or quarantine facilities, just a warning added to the subject line to enable suspect messages to be processed using local client rules.

In its favour, once installed, the Gatekeeper Card Pro requires little management. We tested it standalone, using a browser to configure and monitor the card's activities, but for large-scale deployments a separate management server appliance is also available.

There's a simple choice of three security policies – low, medium and high – which can either be used as is or further edited. A dashboard display indicates the risk level, with separate meters to show the number of recent firewall, malware and IDS/IPS events together with tools to graph those events, see what triggered an alert and browse the logs maintained by the card.

Updates are retrieved and applied automatically and we found the Gatekeeper Card Pro effective and easy to maintain. Just don't expect it to deliver everything you need to keep notebook users secure. *Alan Stevens*

Verdict

Pros Covers the main security bases on a single card; difficult to bypass/disable; minimal impact on host performance

Cons Only protects network connections; slow to restart from hibernation; limited customisation

Overall Easy to manage and hard to circumvent security solution, but doesn't provide total protection

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £116.33 (£99 ex Vat)

Contact Yoggie Security Systems
00 800 46 964443, www.yoggie.com

Specifications Express Card/34 adapter • Freescale i.MX31 processor • 128MB Ram • 128MB flash memory • security hardened Linux OS • stateful inspection firewall • anti-virus/spam/phishing/spyware • Intrusion detection/prevention • URL filtering • VPN client • transparent web/email proxies

MULTIFUNCTION PRINTER

HP CM2320fxi

This MFP is a real small business workhorse



It may not be the cheapest multifunction printer on the market, but that doesn't matter. The HP CM2320fxi is a quality product and a lot more than just another printer with a scanner on top.

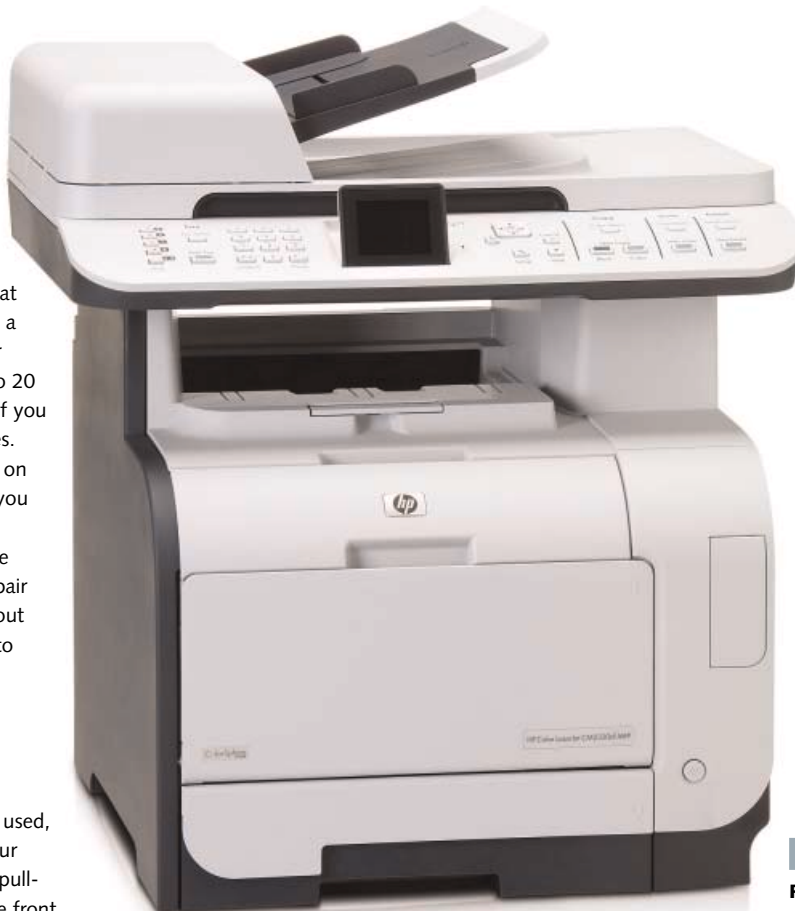
Unlike cheaper inkjet-based MFPs, the laser engine at the heart of the HP product is a very capable single-pass Color Laserjet, able to produce up to 20 A4 pages per minute – or 21 if you opt for smaller US Letter pages. Print quality is excellent, even on plain photocopier paper, and you get plenty of paper handling options with, on the top of the range fxi model we tested, a pair of 250-sheet drawers, a fold-out 50-sheet multi-purpose tray (to handle envelopes and other awkward materials) and a duplexer, all as standard.

Maintenance couldn't be simpler. As with all Laserjets, all-in-one toner cartridges are used, the four required to print colour simply slotting into place in a pull-out drawer accessible from the front. A full set of cartridges is supplied, pre-installed, and these should last for around 3,500 pages (black) and 2,800 (colour), with replacements readily available at around £77 (ex Vat) each.

You can't miss the scanner. It's a 1,200dpi flatbed unit, mounted on top of the laser with a 50-sheet automatic document feeder attached. Between the two is the catch area where finished documents are deposited.

For connectivity there's a USB2 port for local PC attachment, an Ethernet interface and, on the fxi, an integrated fax modem. A 450MHz Motorola processor provides the necessary power with 160MB of memory, easily upgraded using industry standard DIMMs. PCL and Postscript emulations are both supported, with Windows and Apple Mac drivers supplied. Also included is a copy of the Readiris Pro OCR program and a number of HP utilities, amongst them a tool to order consumables over the web.

We found the CM2320fxi simple to operate, with a clear and easy-to-use colour display at the front and an array of controls alongside. Using these we were able to produce quality copies straight away simply by following the instructions on the pop-up screen. We



Print, scan, copy, fax, this Colour Laserjet MFP does it all

tried a variety of originals and all were handled well. There were a couple of jams when we used flimsy paper but these were quickly cleared.

Unfortunately you can't scan documents to network shares from the front panel, but we were able to remotely scan to a folder on a network PC. It's also possible to scan documents and then email them, either using an email client on a locally attached computer or via an SMTP server direct from the MFP. However, some setup work is required to begin with and it was frustrating to find that we couldn't email scans via servers that required sender authentication.

On the plus side there's a built-in address book to save having to keep typing in email addresses and this and other settings can be configured remotely, via a browser, as well as from the local display.

Finally, completing the package, is a set of memory card slots, making it possible to print photos without having to read them to a PC first. You can also save scans direct to a memory card. The only thing missing is a USB interface to enable the same to be done using a memory stick.

Alan Stevens

Verdict

Pros Color Laserjet engine; duplexer; easy to operate; scan to email; scan to and print from memory cards

Cons More expensive than inkjet-based MFPs

Overall You'll pay a little bit extra for this MFP, but you get a whole lot more for your money

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £609.83
(£519 ex Vat)

Contact HP 0845 270 4215,
www.hp.com

Specifications 21 page per minute colour laser • 600dpi • 40,000 pages/month • 1,200dpi colour scanner • 50-sheet ADF • 450MHz processor • 160MB Ram (upgradable to 416MB) • USB2 and Ethernet interfaces • integrated fax modem • dual 250-sheet paper trays • 50-sheet multi-purpose tray • integrated duplexer • memory card slots • print/copy/scan/fax

DOCUMENT SCANNER

Canon DR-3010C

Scanning on a large scale – fast and with minimum fuss



The diminutive DR-3010C can scan up to a remarkable 30 double-sided pages per minute



Size-wise there's not much to the latest member of the Canon Image Formula family of workgroup scanners, but don't let that fool you. Despite its small dimensions the DR-3010C is the fastest in the range, capable of scanning up to 30 double-sided pages per minute. Moreover, with a duty cycle of 3,000 documents a day, it's the ideal tool where high volume data capture is required.

Unlike the networkable Scanfront 220 which we reviewed in February, the DR-3010C is designed to be directly attached to a host PC via its high speed USB2 interface, using the cable supplied. It also lacks the large screen of the Scanfront with, instead, a tiny LED display indicating the job selected, with buttons to start and stop the scanning process. Up to nine pre-programmed jobs can be selected this way, for example, to scan direct to a printer, effectively turning the scanner into a desktop copier, to attach scans to email or create searchable PDF documents.

Maximum resolution is 600dpi, but the settings chosen have no effect on throughput. You also get the same speed whether scanning for black and white, greyscale or colour. Power comes from an external AC adapter and can be turned on and off automatically with the host PC. The only parts likely to need attention are the feed rollers, which tend to wear out after 100,000 documents have been scanned. A message will be displayed when that limit is exceeded.

The main reason why DR-3010C is so small is that it's a sheet-fed device. The originals to be scanned are loaded into a 50-sheet hopper on the top of the unit, then drawn across the scanner heads, where both sides are read together, before being put into a fold-out catch tray at the front. The paper path is very

short with a built-in ultrasonic double feed sensor, automatic paper size and colour detection plus intelligence to de-skew and generally improve image quality on the fly.

Despite all that, the DR-3010C is remarkably quick, documents whizzing through the unit in our tests. It can handle a wide variety of document sizes and paper thicknesses. We tested mostly with A4 and Letter originals, but long documents such as invoices fastened together can be handled and folded documents larger than A4 scanned and rebuilt. It can even cope with paper and plastic cards, with an application called Presto Bizcard included, so you can create a database of contacts using cards captured by the Canon scanner.

Installation is fairly straightforward with a driver and custom scanner software (Captureperfect) installed from the CD supplied when the DR-3010C is first plugged in. Using these you can start scanning and capturing documents straight away, although a number of more specialist standalone applications are also shipped with the scanner, including the SE edition of Nuance's Paperport document management system. Omnipage SE is, similarly, supplied to convert scanned documents into editable text, along with a copy of the Standard edition of Adobe Acrobat 8.0 to create and manage PDFs.

Twain and ISIS drivers are also included, making it possible to use the DR-3010C with most existing document management systems.

For a high speed workgroup scanner the DR-3010C isn't that expensive and, in practice, proves boringly dependable, getting on with the job of scanning large volumes of documents with the minimum of fuss.

What more could you want?

Alan Stevens

Verdict

Pros Fast; high duty cycle; small desktop footprint; bundled applications

Cons Can't handle bound or very large documents; limited to 600dpi

Overall A fast and capable scanner for use with high-volume data capture applications

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £675.63
(£575 ex Vat)

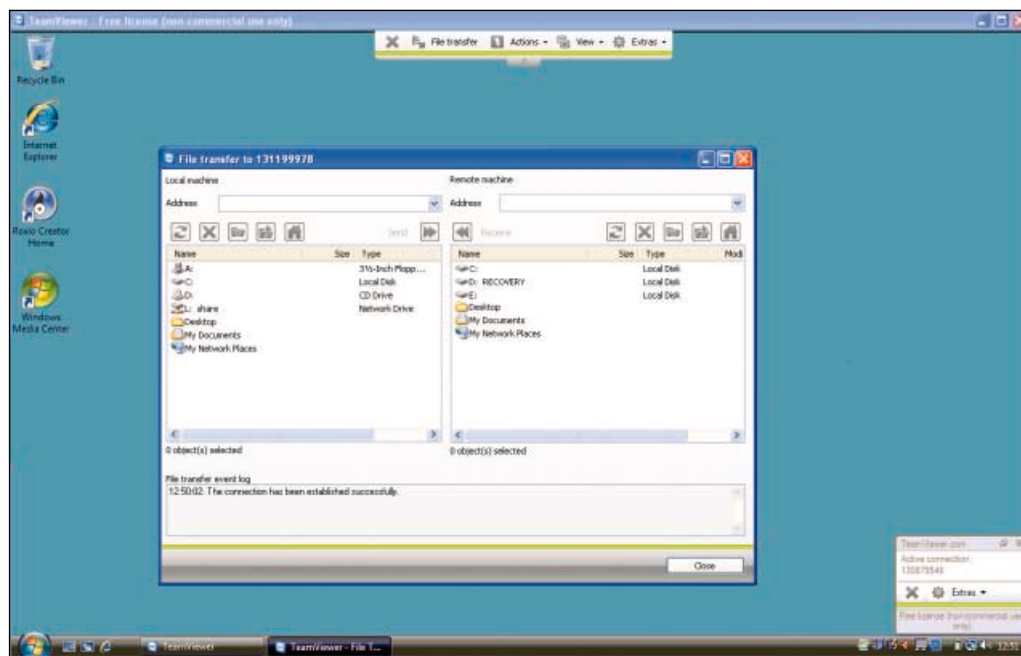
Contact Canon 01737 220 000,
www.canon.co.uk

Specifications Sheet-fed 600dpi colour scanner • LED light source • USB2 interface • 50-sheet automatic document feeder • 30 pages (60 images) per minute • 3,000 pages/day duty cycle • Twain/ISIS drivers • bundled document scanning and management applications

REMOTE CONTROL SOFTWARE

Teamviewer 3

Take control of remote systems with this easy-to-use utility



As well as remote control, Teamviewer can also be used to chat, transfer files and give presentations, with no remote host installation needed

Ever wished you could fix customer problems remotely, give a presentation over the internet or retrieve important files when out of the office? Teamviewer 3 is a secure and affordable remote control solution that can do all this and more, and with remarkable ease.

The software involved is amazingly compact. Available for use with both Windows (98 or above) and Apple Macs, the download for the main Windows Teamviewer executable is a measly 1.6MB in size and takes just a few seconds to install. Moreover, you can opt to simply run rather than install the program and do so even if you don't have admin rights to the PC concerned.

Of course, you're asked a few questions when the program starts, so there's an even smaller Quicksupport module (1.3MB), designed expressly for customers to download and run on-demand. This requires no user input to work, and can even be branded with your own logo and contact details.

Unlike many alternative products, you don't need to know the IP address or name of a Teamviewer host in order to connect to it. Instead a unique partner ID, generated each time the program starts, is used to identify the target PC via a hosted routing server. An associated password is also generated for every session, and Teamviewer encrypts all the traffic involved using 256-bit AES encoding. You have to phone the ID and password through, or email it to the other user but, that apart, there's no need for any special setup. And it's all done using HTTP port 80 so, with few exceptions, firewalls and proxy servers shouldn't cause any issues.

Remote control sessions can be run in either direction, with chat and file transfer facilities also

available, alongside a tool to record each session as a movie. You can even use Teamviewer to create a VPN (Virtual Private Network) tunnel between the two systems, giving the remote PC unfettered access to network resources, although special network drivers have to be installed for this to work.

We tried the program on a number of PCs and were impressed by both how quick it was to get running and at the level of performance on offer once a session was established. The faster the link the better, but it was good even on low bandwidth Wan connections.

The need to have someone at the other end to provide the ID and password was a bit irksome, but once connected it's easy to re-configure the program to run as a service and fix the password required for access. Also, with the latest version a separate Teamviewer Host module is available, which is optimised to provide access to unattended servers and PCs, with additional facilities to remotely log in and out or reboot target systems.

For personal use Teamviewer is free (a pop-up is displayed after each connection) while for commercial use two licences are available – Business and Premium. Both support an unlimited number of remote clients, but with the Premium edition (£806 ex Vat) you can have multiple "supporter" systems with an extra management module also included to organise, manage and bill for Teamviewer connections.

Of course, there are lots of other remote control applications out there. Few, however, match up to Teamviewer when it comes to ease of use or price, and there is a lot in this package to tempt the small business buyer.

Alan Stevens

Verdict

Pros Fast to set up and use; can be run without installing; branding of Quicksupport module; free for personal use

Cons No Linux/Unix support; need to communicate partner ID and password for ad-hoc sessions

Overall Not the only remote control application on the block, but quick and very easy to use and a good small business buy

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price £472.35 (£402 ex Vat) for Teamviewer Business licence

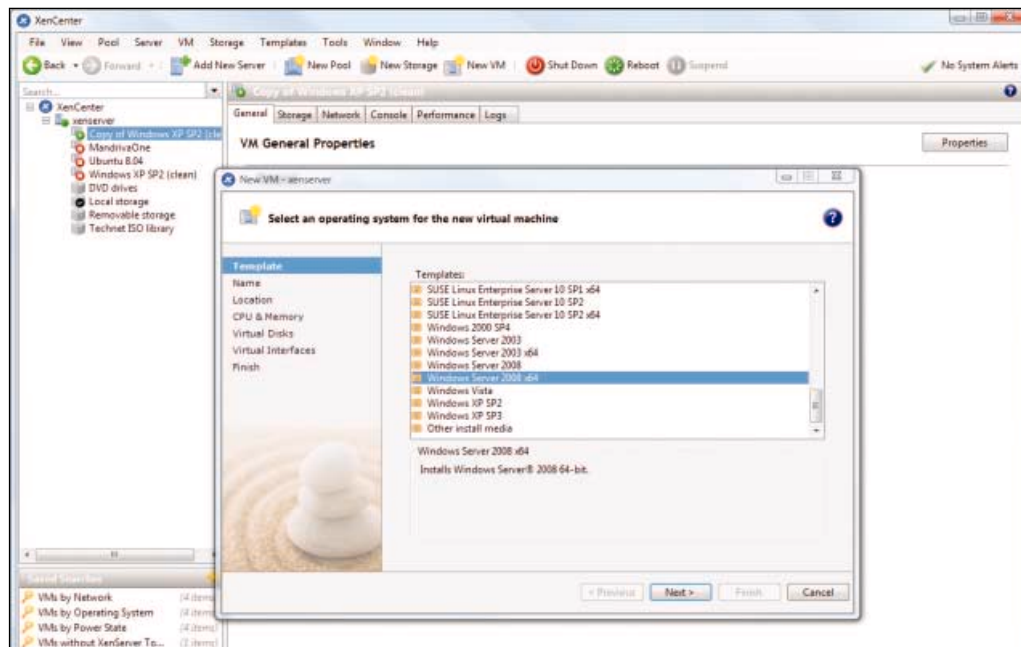
Contact Teamviewer 020 8099 7265, www.teamviewer.com

System requirements Windows 98 or later; Mac OS X 10.4 or later • internet connectivity

SERVER VIRTUALISATION

Citrix Xenserver 5

The latest Xenserver is ready to take on hypervisor rivals



Xenserver 5 is much enhanced with support for guests running Windows Server 2008, and new automated high availability and disaster recovery options

A lot has happened since the release of Xenserver, the first commercial implementation of the open source Xen hypervisor (PCW May 2007). First it became a Citrix product quickly followed by two new releases, the latest of which, Xenserver 5, sees a major reworking of the platform to better equip the Citrix implementation to challenge VMware and Microsoft alternatives.

Based on the latest 3.2 release of the Xen hypervisor, also found bundled with a variety of Linux distros, Xenserver 5 has much the same hardware requirements as previous versions. Effectively that's a server with either Intel VT or AMD-V enabled processors, onto which the software is installed directly without the need for a host OS. Host servers can have up to 32 processors and 128GB of memory, while guest virtual machines can be configured with a maximum of eight virtual CPUs and 32GB of Ram.

A tool to convert existing physical servers to VM format has been added in the new version (Xenconvert), while another obvious change is the ability to manage the server from a local console. The remote Xencenter console too comes in for a major overhaul, with a slicker interface and user defined grouping and tagging options. New monitoring and reporting tools have also been added, along with email alerts to warn both of host failures and potentially problematic changes to VM configurations.

Bundled as standard with all versions of Xenserver, the Xencenter console lets you create, run and manage virtual machines across multiple servers, each running its own Windows or Linux software with support for both 32-bit and 64-bit implementations. The ability to run Windows Server 2008 has been added in the new

version, along with the latest Red Hat and Suse Enterprise Linux implementations, plus Windows XP SP3 and Vista SP1.

Also provided are tools to pool server and storage resources, with enhanced native support for shared network storage, particularly San and Nas products. New too is the ability to offload fast cloning and taking of snapshots to storage subsystems, and automated high availability and disaster recovery facilities to restart and even migrate running VMs to other servers when hardware or software problems occur. Indeed it's in the area of high availability that most of the major improvements are to be found, Citrix looking to address many of the single point of failure issues that can arise when server workloads are consolidated using virtualisation.

Unfortunately you only get these options in the more expensive versions of the product aimed at larger organisations with big budgets. The Enterprise edition we tested – from \$3,300 (£2,000) per server with no processor/core limits – includes support for live migration of VMs and most of the automated high availability options. The Platinum edition extends the feature set by adding more sophisticated dynamic provisioning of workloads across virtual and physical servers, albeit at a cost of \$5,500 (£3,400) per server.

Small companies with more modest requirements are likely to go for the Standard edition, which costs \$990 (£600) per server, again with no processor/core limits and which can be deployed on multiple servers, or the Express edition which you can download and run on a single server with up to two processors for free, without the VM and memory restrictions imposed on previous versions of this edition. *Alan Stevens*

Verdict

Pros Extended guest support; enhanced shared storage support; automated high availability and disaster recovery options; integrated P2V converter

Cons High availability and dynamic provisioning features only on more expensive editions

Overall A much enhanced server virtualisation platform that compares well against the VMware and Microsoft alternatives

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall ★★★★★

Price From \$990 (£600) for the Standard edition

Contact Citrix UK 01753 276 200
www.citrix.com

System requirements

Server with Intel VT or AMD-V processors

LAPTOP & MAC REPAIR CENTRE

355 KING STREET
W6 9NH LONDON
HAMMERSMITH
TEL: 0208 222 8686
www.laptoprevival.co.uk



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Available in: 450W, 550W, 650W, 750W, 850W, 1000W, 1200W

ENGINEERING

be quiet!

A NEW DIMENSION OF SILENCE





WE'VE GOT IT COVERED

Hands On is the part of the magazine where we go under the covers and help you make the most of your computer, and this month's no exception. We have a look at some useful command line tricks in Windows this month, and tips on securing your SQL in Visual Programming. Spreadsheet users can learn how to make their first macro, and in Databases we discuss when to use a spreadsheet.

In Sound we look at tagging files and then you can turn to Performance to see how to get the best out of a Squeezebox. In Hardware we look at upgrades, and Linux users can learn about disk recovery. Flash video is the focus for Digital Imaging, a home mail server for Networks, and finally we discover how to make indices in Word Processing. All this and, of course, your problems solved in Question Time.

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Far left: The BBC's iPlayer uses Flash to show its video content (see page 140)

Left: Upgrading a PC's parts need not cost a fortune (see page 124)

HANDS ON

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- WORKSHOPS
- HARDWARE SOLUTIONS
- SOFTWARE SOLUTIONS
- Q&A

Advice from our experts

PCW's experts solve your problems

DATABASES

Q I've heard that in Access 2007 you can see a form and a datasheet view on the screen at once without having to build this view manually. This is a feature I've been waiting for and if it has been implemented, it's enough to make me upgrade!

JB Cartwright

A You can start downloading now because a split-screen view is now offered in Access 2007.

The new Split Form (see screen 1) has been introduced to let you see the form view and the datasheet view at once.

It's a useful addition and although it is possible to achieve manually it's certainly quicker in '07.

Having both on screen can be handy because finding a record by eye is often faster from a datasheet, but editing is usually easier from a form (it's also likely to be more accurate as you're dealing with one record, rather than a grid of similar rows – and it's even more helpful with wide tables.)

To create a split form based on an

existing table, open the table in Datasheet view and click Split Form on the Create tab. If you like the result, save the form and it's ready to use.

To show an existing form in Split Form view, open it in Design view and display the form's properties (F4 is the shortcut). From the top of the property sheet select Form from the dropdown list, if it's not already selected. Go to the Format tab and set the Default View property to Split Form. Check how it looks back in Form view – the

'A split-screen view is now offered in Access 2007'

default split puts the datasheet on top with the form below – if it isn't quite what you want there are several other properties you can tweak.

You can, for instance, set the Split Form Orientation property to display the datasheet at the bottom, to the left or to the right. If you set the Split Form Splitter Bar property to Yes, you can alter the proportion of the screen that displays the datasheet by dragging the splitter bar.

ObsDate	ObsTime	Species	NoObserved
04/07/1983	08:00	Blackbird	1
04/07/1983	08:00	Dunnoek	1
04/07/1983	08:00	Greenfinch	3
04/07/1983	08:00	Robin	1
04/07/1983	11:00	Blue tit	1
04/07/1983	11:00	Robin	2

A Split Form with the form on top and the datasheet below

HARDWARE

Q Some time ago, Gordon Laing gave a rundown on changing out a Sky+ hard disk drive. I have a Sky HD box which has a noisy disk and would benefit from a new one. Can you advise me which PCW issue had this article and how I should proceed?

Bill Crook

A Our original guide to upgrading the hard disk in a Sky+ box was published in the July 2006 edition, but the process is a little different for a Sky HD box.

For starters the Sky HD box employs Sata disks, whereas the original Sky+ used older parallel ATA (Pata) models. In theory the process is similar – you shut down and open the box, swap the hard disk for a new model, then reassemble it.

In practice there are a few restrictions. According to the numerous enthusiasts who've posted their experiences on specialist forums Digital Spy (www.digitalspy.co.uk/forums) and AV Forums (www.avforums.com), larger hard disks will first need to be prepared with a utility called Copy+. This can also transfer recordings from an existing disk to your new one – find out more at www.skycopyplus.co.uk.

As with the original Sky+, there's a handy guide to upgrading the disk in the HD model at www.tinyurl.com/3hhlxr.

As with all modifications of this nature, you will invalidate your warranty and we cannot offer any support should things go wrong – so proceed at your own risk.

We'd also strongly recommend studying the various threads on the forums above to see how others have handled the upgrade. On the upside, many owners are reporting success with 1TB drives which run more quietly than the original, so it may be a risk you're willing to take.

Q After numerous tweaks, clean-ups and Ram upgrades, I've come to the conclusion

that I'm getting about as much as I can out of my current 3GHz Pentium 4 plugged into an Abit IC7-G motherboard. The problem, however, is where to go next.

Most of my work involves using the Adobe CS3 suite, as well as creating DVD slideshows using Pro-Show Gold, so I would like to move up to something that will get the best out of these – at the moment it takes a long time to create the video for DVD projects.

I'm interested in a dual or quad-core CPU in a new motherboard, but models which match the clock speed of my current processor are too expensive.

Would I notice any benefit from slower, but multi-core processors like the Q6600, and will I be able to use more than my current 3GB of Ram with XP Professional?

Barrie Potter

A If your software can exploit multiple CPU cores, then you will notice a significant benefit from switching to a dual or quad-core model, even if it's clocked slower than your current Pentium 4.

But if they're single-threaded applications and you're not doing anything else at the same time, then such an upgrade may not offer the benefits you're looking for.

A number of filters and exporters in Adobe CS3 will certainly exploit multiple cores, but unless you regularly use these processes you won't notice much difference.

Video encoding, however, is an application which can seriously benefit from multiple cores. If the software supports it, you could be looking at halving the times taken, or more.

Unfortunately Photodex, which produces Pro-Show Gold, doesn't explicitly mention support for dual or quad-core CPUs in its system requirements, so we'd recommend contacting them directly or checking support forums to see if other owners can comment.

Since the software does support modern features like burning to Blu-ray, we'd be surprised if it doesn't exploit at least two processor cores when preparing video.

As for the Q6600, it's a great value quad-core processor, and even if your software doesn't always exploit all four cores, it will allow you to run multiple applications more responsively than your current single core chip.

Position your pictures

DIGITAL IMAGING

Q I recall reading in PCW that it is possible to add GPS information to digital photos from a sat nav. I have a Tomtom One Explore in-car sat nav which I bought from Halfords.

Is it possible to transfer the data from this and add it to photos? I don't usually venture far from the car when taking pictures so the positional information would be accurate enough for me.

Mark Harrison

A To geotag digital photos with GPS positional data you need a sat-nav device which stores a record of your movements as a series of co-ordinates in a track log. Pretty much all sat-nav devices do this, so that's the first hurdle crossed.

The next one isn't so straightforward. You need to get the data from your sat nav onto your PC. This usually involves connecting it via

a USB cable, but not all devices are capable of this kind of data transfer. You would need to check your Tomtom documentation to see if your device can do this. If it can't, most new handheld GPS devices designed for outdoor pursuits have this capability, or there are a variety of small units designed for photography made by Nikon, Sony, Jobo and others.

Then you'll need to download the tracklog and convert it to the GPX format used by most geotagging applications. For this you can use the free GPStabel (www.gpsbabel.org). Lastly you'll need an application that adds the latitude and longitude data to your photos by matching up the time data from the GPS tracklog with the Exif time stamp on your photos – it's essential to synchronise your camera clock with your sat-nav device before you begin. For this you can try Robogeo www.robogeo.com, or the free GPicsync www.tinyurl.com/48r9pc.

You can find the original Hands On geotagging article at www.pcw.co.uk/2198421.

In terms of Ram, installing more than 3GB could have benefits in programs like Photoshop if you regularly handle large or multiple images, but 32-bit operating systems like XP Pro will only be able to use a maximum of around 3.2GB. If you want to use more Ram, you'll need a 64-bit OS like Vista 64 or XP 64.

SPREADSHEETS

Q I am using Excel to produce a rota for volunteers who work on Monday, Wednesday and Friday of each week. Entering the day sequence is easy, but is there a way to automatically fill the dates?

John Clarke

A Enter the date of the first Monday you need in cell A2. Let's say it is 5/1/2009. Format that cell as a date. If you want to

A
Mon 5 Jan 09
Wed 7 Jan 09
Fri 9 Jan 09
Mon 12 Jan 09
Wed 14 Jan 09
Fri 16 Jan 09
Mon 19 Jan 09
Wed 21 Jan 09
Fri 23 Jan 09
Mon 26 Jan 09
Wed 28 Jan 09
Fri 30 Jan 09
Mon 2 Feb 09
Wed 4 Feb 09
Fri 6 Feb 09

SCREEN 2

A	B	C
Hours	Rate	Discount
1.00	£22.00	
1.50	£27.00	18.18%
2.00	£32.00	27.27%
3.00	£45.00	31.82%

SCREEN 3

Calculating discounts as percentages

display the date like Mon 5 Jan 09 then create the Custom format, ddd d mmm yy for A2 and A3. In cell A3 enter =IF(WEEKDAY(A2)=2,A2+2,IF(WEEKDAY(A2)=4,A2+2,IF(WEEKDAY(A2)=6,A2+3)))

(Key: ⌘ code string continues)

Drag this formula and its format down the column as far as you need to give you the dates of sequential Mondays, Wednesdays and Fridays (see screen 2).

Q I have taken over a service business that has been charging £22 for an hour, £27 for an hour and a half, £32 for two hours, and £45 for three hours. How can I calculate as percentages the different discounts given?

Joann Jenkins

A rota for only three days a week

A Enter the quoted hours in the range A2:A5. Enter the equivalent rates in B2:B5.

Reclaim your space

LINUX

Q I have a large data partition which is nearly full. The system tells me that I have no space, but looking at the 'df' command I can see there are still several gigabytes. Is this a bug, or can I get this space back?

Frank Oliva

A When you create a new ext3 filesystem with Linux, by default five per cent of the

space is reserved for root – a normal user cannot create files in this space, but root can.

For small filesystems, five per cent is sensible, but it may be excessive for large ones.

You can change this reserved amount with the tune2fs command. To set it to one per cent for the partition /dev/sda1, run as root:

```
tune2fs -m1 /dev/sda1
```

You can set this value to zero (not advisable for boot partitions).

Format C3:C5 as a percentage. In cell C3 enter

```
=((B$2*A3) - B3) / (B$2*A3)
```

Drag this formula down to cell C5. When you charge £27 for an hour-and-a-half instead of the expected £33 you are giving an 18.18 per cent discount. Charging £45 instead of £66 for three hours means you are giving a 31.82 per cent discount (see screen 3). This can be good business if you are offering something like sailing lessons but obviously not for a bricklayer.

Q I have just produced an Excel spreadsheet for a shift rota. I want to give each employee a different background colour for each cell that displays their name.

As Conditional Formatting has a limit of three conditions, and at present we've six employees, is there a way that I can put all six names into Conditional Formatting?

Les Sambrook

A The simplest way would be for your business to move up to Excel 2007. It lets you set 64 different Conditional Formats – with optional gradient colours, data bars, and icon sets. Conditional Formats are also easier to apply.

Q Is there a way to add the same Comment to lots of different Excel cells?

Monroe Martin

A Add the Comment to the first cell in which you wish it to appear. Right-click on the edge of the Comment box and choose Format Comment. Format the font and border to taste. Choose all the other cells where you want the Comment to appear. If it's a range, hold down Shift and click on the first and last cell. If the cells are spread about, as in the illustration, hold down Ctrl and click on each applicable cell.

Right-click on the first cell again and choose Copy. Then right-click anywhere on the worksheet and choose Paste Special. From the list of options choose the Comments radio button and OK. The Comment will then appear in all the selected cells (see screen 4).

Q How can I count the number of words contained in an Excel cell?

Shelley Peak

A There are a number of formulas you can use to do this. If the words are in cell A1

```
=LEN(TRIM(A1)) - LEN(SUBSTITUTE(
```

```
TRIM(A1), " ", "")) + 1
```

is probably the shortest. Though accurate if there are words in the cell, it will give a count of one when the cell is empty. If that bothers you, you can use

```
=LEN(TRIM(A1)) -
```

```
LEN(SUBSTITUTE(TRIM(A1), " "
```

```
","")) + (LEN(A1) > 1)
```

The Microsoft-recommended version is

```
=IF(LEN(TRIM(A1))=0,0,LEN(
```

```
TRIM(A1)) - LEN(SUBSTITUTE
```

```
(A1," ","")) + 1)
```

Q Is it possible to sort Excel column headings in alphabetical order?

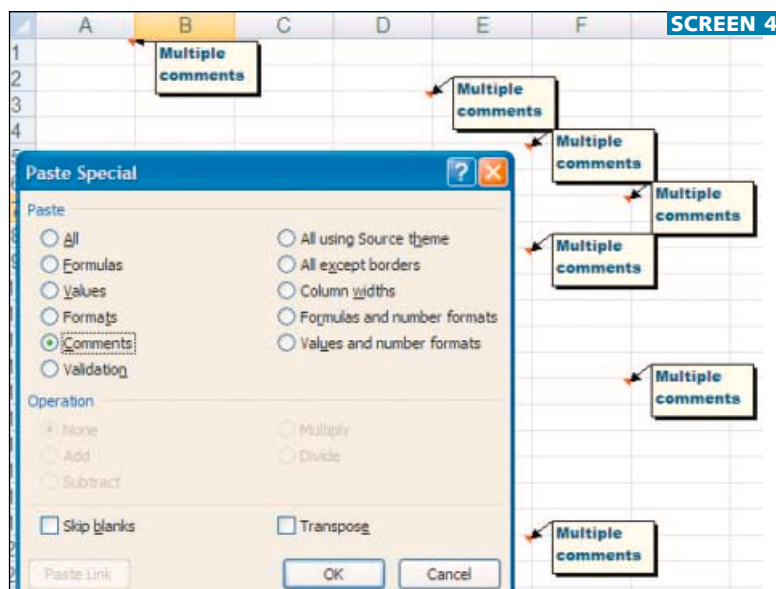
Aiden Hansell

A Highlight the entire data table. In Excel 2007, under the Data tab choose Sort. Click the Options button and choose Sort left to right, and then OK. In the Sort dialogue box have it read Sort by Row 1, Sort on Values, Order A:Z.

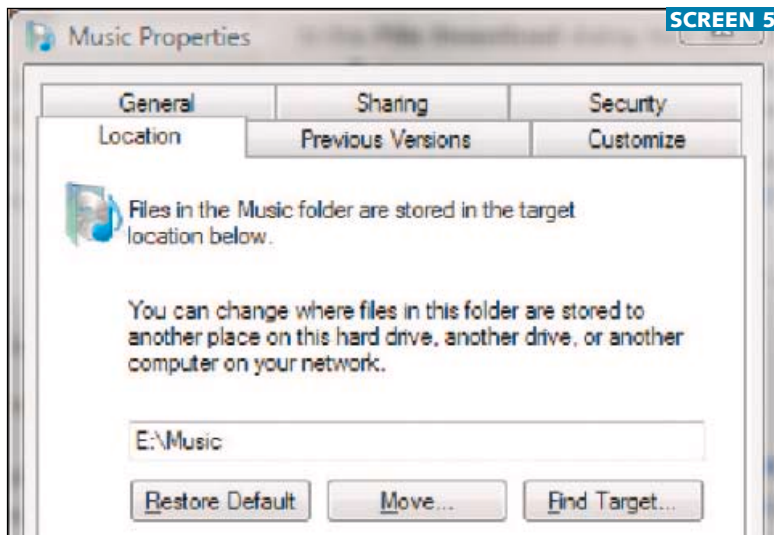
In earlier versions of Excel, highlight the entire data table, choose Sort on the Data menu. Choose Sort, Options and the Sort left to right button. In Excel 2002, the Sort dialogue box will show Sort by Row 1, Ascending, First key sort order Normal.

WINDOWS

Q I recently acquired my first Vista computer (Home Premium on an Acer notebook). It came preconfigured with a C drive and an empty D drive labelled Data. In my previous XP system I was able to remap the My Documents folder to a separate data drive to make it easier to back up all my data as a single drive letter. I haven't been able to find a way to do



Adding one
Comment to
many cells



SCREEN 5

this in Vista. However, the fact that Acer saw fit to provide a separate data drive must mean something, and I'd like the default Documents folders (at the very least) to go there and be recognised. Can you help?
Bill Hamilton

A Click on the Start button – or Vista orb as we are supposed to call it. Right-click on Documents and choose 'Properties'. Turn to the Location tab and change the path in the box to the desired destination; you have to type this in as there's no browse button and it must be an existing folder. Click OK and you'll be asked if you want to move files from the old, default, location to the new. Repeat for Music and Pictures should you so wish (see screen 5).

WORD PROCESSING

Q I am typing a list of lots for an auction using a table in Word and the Verdana font, but each time I move down one line it changes back to Times New Roman. How can I stop this? I am using Office 2003 and Vista Home Basic.
Leslie Hunt

A This happens because each cell defaults to the Table Grid style, which uses the Times New Roman font. There are two solutions. One is to forget the formatting until you have everything typed up. Then select the entire table and format the font accordingly.

A better way is to modify the style before you type the table – it should be showing as Table Grid. Go to Format, Styles and Formatting and select the Table Grid style. Right-click on this and choose Modify – you'll then be

able to set the font to whatever you want and this won't change back as you move from cell to cell.

Q Is it possible to change the colours of the wavy underlines for spelling and grammar errors in Word 2007? One of our users has trouble distinguishing between red and green, so it would be helpful to use different colours.
Derek Griffith

A Red-green colour blindness affects a significant number of people, so perhaps red and green were not the best colours to choose. They can, however be changed. Word 2003 and XP came with a macro for doing this, but 2007 doesn't seem to provide this, so you have to hit the Windows Registry directly. This method works for all three versions.

Having made a System Restore Point go to HKEY_CURRENT_USER \Software \Microsoft \Shared Tools \Proofing Tools. Create a new DWORD named SpellingWavyUnderlineColor and double-click on it.

Make sure the Hexadecimal base is chosen and type in the red, green and blue components of the new colour in hexadecimal.

This may take a little experimentation, but, for example FF0000 is pure red, 00FF00 pure green and 0000FF pure blue. So, for example, FF80C0 gives a rather fetching shade of pink.

If juggling hexadecimal colour values doesn't come naturally, then you can use Word's custom colour picker to get the RGB values in decimal, then Windows calculator to translate these into hex.

Changing Vista's default data locations

Q I've inherited a lot of Word documents that appear to have been created 'typewriter style' in that the author used multiple strikes on the space and tab keys to indent lines.

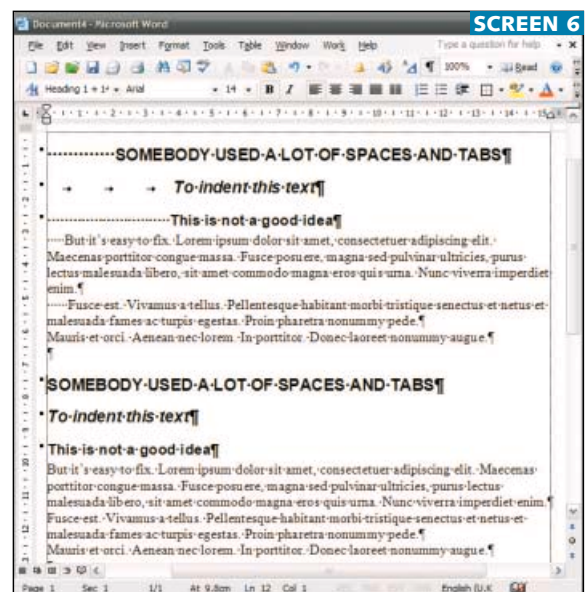
I know that Autoformat can get rid of these, but it also makes several other, unwanted changes. Is there a better way?

Margaret Eliot

A There is and, having selected the offending text, it takes just two clicks (see screen 6).

Click on the Centre Align button (or Control & E) and all the selected paragraphs will appear centred – but the leading spaces will vanish.

Now click the Left Align button (or Control & L) and the text will be left aligned – but the spaces will not return. **PCW**



SCREEN 6

Getting rid of leading spaces with two clicks

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Windows win@pcw.co.uk

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Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Hardware column.

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Rebuild, recycle and re-use

Careful upgrading can help you save money as well as improve performance

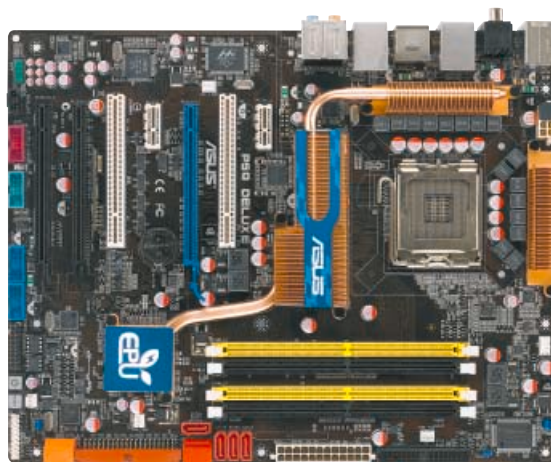
If you're a serious hardware enthusiast, you'll know that incremental upgrades can only go so far to satisfy your desires for the best performance; there comes a time when only a new build will do. For me, that process traditionally took place annually, so imagine my surprise when I realised I'd actually assembled my main PC more than two years ago.

I'd built this system around an Asus P5W DH Deluxe motherboard, which had proven adept at accommodating new technologies. Over the years it had gone from being a Pentium 4 with 2GB of Ram and a single hard disk to a Core2Duo with 6GB of Ram and four hard disks, three of which were in a hardware Raid 5 configuration. It had served me well, but a failed attempt to install a 45nm quad-core processor proved it was time to move on.

In last November's Hardware column, I described two types of build: those that are timed to exploit the latest technologies, and those that simply recycle a number of existing parts with a few key new ones. If you have the budget for the former, then it makes sense to investigate a new build based around Intel's latest Core i7 architecture (previously Nehalem), or perhaps wait for the mainstream versions to become available.

Since I already had significant investments in both memory and what was until recently a top-end CPU, I opted for the recycle option. I'd be building a new PC, but almost entirely with existing components acquired over the past year. It wouldn't boast the latest architecture, but it would still be a decent upgrade over my existing configuration, while also ensuring the least waste.

While more a rebuild than a brand new build, projects such as these can be satisfying. You get to re-use your best existing parts and only buy what's



needed to satisfy your requirements. Crucially, it also gives you the chance to perform a clean reinstall, so you can wipe the slate clean.

Considerations

When planning a new build, it's important to step back from the latest technology and think about what is limiting about your current system, as well as what you'd like to achieve. Are you running low on space? Would you like to watch HD content smoothly? Are videos taking too long to process? Would you like a boost in 3D gaming? The answers will, in effect, focus your budget on the most relevant areas, rather than just going for an upgrade that may not be as effective for your requirements.

Personally, I spend most of my non-writing time on the computer processing photographic images and editing videos. The latter in particular consume a terrifying amount of storage, so larger capacity was a must.

Core2 Extreme processors represent the top of the range for the Core2 platform. If you're not yet ready or willing to switch to the Core i7 Nehalem platform, they're a good choice for upgraders

If you'd like to support the latest 45nm Core2Duo processors but prefer to couple it with affordable DDR-2 memory, the Asus P5Q Deluxe is a great motherboard to consider

Responsive editing of both standard- and high-definition content was also important, as was reducing the time spent waiting for rendering and transcoding, so greater processing muscle was in order. As a non-gamer, there wasn't any need for a graphics upgrade, especially as my current configuration was already happy playing HD content.

With this in mind, I then looked at what parts I could re-use in a new project. As mentioned earlier, I already had 6GB of Crucial DDR2 Ram in my old system, which was adequate for my requirements. I also had an Intel QX9650, which would deliver the required boost in processing over my existing Core2Duo E6700, but it just wouldn't work in my old board.

So, the most important new component in my project would be a motherboard that could support both my QX9650 processor and existing DDR2 memory. Since I'd been so happy with my previous Asus P5W DH Deluxe, I opted for the P5Q Deluxe motherboard, which supported the required technologies and also featured illuminated power and reset buttons on its surface to help those





Hot processors require significant cooling. Zalman's latest CNPS9700-NT kept our Intel QX9650 cool while remaining discreet in terms of noise

who, like me, tend to build their initial test configurations outside a case.

I would then re-use my existing Gigabyte NX66256DP graphics card and Promise Supertrak EX8350 hardware Raid controller, although I'd swap the current triplet of 300GB disks for three 500GB models I'd bought over the past year to transport data between locations. This would increase the capacity of my Raid 5 array from 600GB to 1,000GB.

This would all be powered by another recent acquisition, a Corsair HX520W supply that could happily keep such a configuration running smoothly, quietly and efficiently. Speaking of quiet operation, the QX9650 required a new heatsink and fan, so I bought a Zalman CNPS9700-NT Super Aero Flower that employs a 110mm fan and four-pin header for extended motherboard control. So the only brand new purchases were the motherboard, heatsink and case.

The new build

Assembling the new system went smoothly, apart from one hitch. While I was intending to use an existing ATAPI optical drive, I took the opportunity to test a serial ATA (Sata) model I'd bought for a future column. With this connected to one of the motherboard's main Sata ports, the system recognised the drive and booted the Windows DVD, but only when the controller was set to IDE in the Bios. If I switched the Bios to AHCI to support the latest features on the hard disk, the Sata optical drive disappeared. Further research revealed some Sata optical drives simply aren't compatible with AHCI, which gives

If you're rebuilding your PC or building a new one from scratch, buy a decent power supply. Models such as the Corsair HX520 can power a modern configuration with high efficiency, consuming the least electricity while generating minimal heat and noise

There's life in the old dog yet

The disadvantage of recycling parts from an existing system for a new build is that the old machine obviously stops working. But that's not to say it should be consigned to the scrapheap. I may have removed the Ram, graphics card and Raid controller from my old PC, but I still had a perfectly good motherboard with a Core2Duo E6700 processor, not to mention spare 300GB disks from my old Raid configuration. With an old graphics card and a modest amount of Ram, this could have become a great server, but I had other plans.

High-definition content was placing a strain on my Media PC, and particularly demanding ones failed to play smoothly. It was in need of an upgrade, so out came the old Asus N4L-VM

DH motherboard, with its T2600 Core Duo processor, and in its place went the P5W DH Deluxe motherboard with the Core2Duo E6700. The 2GB of DDR2 Ram from the old media PC worked fine in the new board.

I also upgraded the graphics card to one that could better offload HD processing. No need for the latest model, so I went for a Gigabyte Geforce 8600 GTS card which, from previous tests, I knew would be more than adequate for my requirements.

So for the cost of a new graphics card I overhauled my Media PC into a high-performance HD system. As for the old board and motherboard, they've been earmarked to upgrade a remote-control Media PC system.

you two options if you're experiencing compatibility issues. You can either leave the optical drive connected to the main controller and set it to run in IDE mode, or connect the drive to a separate controller, allowing you to independently set the first to AHCI for the hard disk, and the second to IDE for the optical drive.

Many motherboards offer two Sata controllers, although beware the second may only be able to support hard disks. Even if it did support optical drives, the second controller may not be 'visible' to Windows until a third-party driver is provided, which in turn would mean needing an alternative drive for the initial installation itself. It's also no good installing Vista with the Bios set to IDE and switching it to AHCI afterwards – it won't work. So if you're planning a new build with a Sata optical drive, it can be worth investigating whether it's compatible with AHCI, and if not what your options are.

Sticking with IDE mode for my initial test installation, the system felt

very quick running Vista 64-bit. My regular process of compressing 1-2GB DV AVI files into sub-100MB WMV versions took just over two and a half minutes instead of over five and a half. Application performance and task switching also felt more responsive.

I feared the hungry QX9650 would consume more power than my old system, but fitted with the same graphics, hard disks and Ram, the new configuration typically consumed 104W when idle or 162W under full load. My old system consumed 170W when idle or 209W under full load with its old power supply, and 153W when idle or 182W under full load when fitted with the same Corsair power supply as the new build. Clearly, the new motherboard and processor were running more efficiently than the old, especially when the system was idle.

It's early days, but so far the configuration proves a rebuild with existing components complemented by key new ones can be as good as, or better than, a new system. **PCW**





Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.

Email performance@pcw.co.uk

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Quality street

Find out how to get the best quality from streaming audio

PC-based audio has improved dramatically over the years, but if you're a dedicated audiophile it can still disappoint. While I still haven't nailed it, my latest attempt, described in October's Inside Information column, got closer than before. A number of PCW readers wanted to know more behind the decisions, so for those who want access to their PC-based music collections, but delivered with top-end sound quality, this one's for you.

First steps

If you want decent sound quality, you have to start with high-quality source material, and that rules out most of the heavily compressed audio in popular use. Instead, you should start with original CDs as these contain uncompressed audio. The purist approach would be to rip this raw PCM data to a WAV file, but they don't natively support the tagging of tracks, albums and artists. There are some utilities that will tag WAV files, but you could end up creating proprietary files with restricted compatibility.

More sensible are lossless audio formats that apply mild compression, without throwing anything away for good, while additionally supporting tags. The choice between them boils down to compatibility with your chosen player and brand loyalty. I personally sided with FLAC, a popular and broadly supported open standard for lossless audio. Windows Media Audio Lossless also sounded fine, but few devices natively support it. Further details can be found at <http://flac.sourceforge.net>. Alternatives include Monkey's Audio Encoder and Ogg Vorbis.

Deciding on a format is only half of a quality source, though, as some tools do a better job of ripping the data from CDs than others. One of the best tools for handling errors is Exact Audio



Copy (EAC) from www.exactaudiocopy.de.

To listen to music files, you'd normally connect a PC to a hi-fi, or stream the files from a PC to an intermediate appliance. I prefer the latter as it allows you to banish the PC to another room and have a small, silent device as your front-end.

My favourite streaming appliance is Slim Devices' Squeezebox 3. It's a compact device with wired or wireless network links and the choice of analogue or digital outputs to your hi-fi. The unit is dominated by a large vacuum fluorescent display and operated either by infrared remote control or a web browser. It sounds good, especially if you take the digital output direct to your hi-fi and lock the variable output. But it ain't high-end hi-fi by a long margin.

I came across several companies offering modifications to the Squeezebox to improve its audiophile credentials. Colorado-based Bolder Cable (www.boldercables.com) offers a variety of options. I went for its Digital Only Mods costing around £125, which delivers a cleaner digital signal and fits a more substantial RCA jack for the coaxial output.

Slim Devices' Squeezebox 3 is one of the best appliances for streaming music from your PC

Another limiting factor is the budget mains power supply that comes with the Squeezebox. Bolder offers a number of modifications to third-party power supplies, along with its own high-end 'Ultimate' power supply, although the latter was too expensive. Instead, I opted for the more affordable VDC-SB power supply from Channel Islands Audio (www.ciaudio.com) for £140 and available with a 240v input.

Bolder requires you to send a Squeezebox to them for modification, but rather than dispatch one from the UK, consider ordering one in the US and have it delivered direct. I ended up buying one from Channel Islands Audio in California and had them ship it and the new power supply to Bolder for the Squeezebox modification; Bolder then shipped the lot to me.

How's it sound?

The modified Squeezebox sounded cleaner and more detailed than a standard unit, even using the original power supply. Swapping to the new power supply refined the output with steadier imaging. And while it's still no match for the more involving output from my Meridian CD 500 transport, it still sounded good.

Since then, Bolder has introduced new enhancements costing around £90 extra, which equip a Squeezebox with a second power input (in place of the headphone jack), allowing a separate clean voltage to be fed to the digital section and clock. An external switcher costing around £100 connects to any Squeezebox power supply and splits the voltage as required.

I'm tempted to consider further modifications to my Squeezebox, but will also evaluate some alternatives involving a PC with a high-quality sound card. If you're a hi-fi nut who's cracked this particular challenge, please get in touch. **PCW**

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DUP-07

DUP-11

DUP-15

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Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Windows column.

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At your command

The Windows command line is still as useful as ever

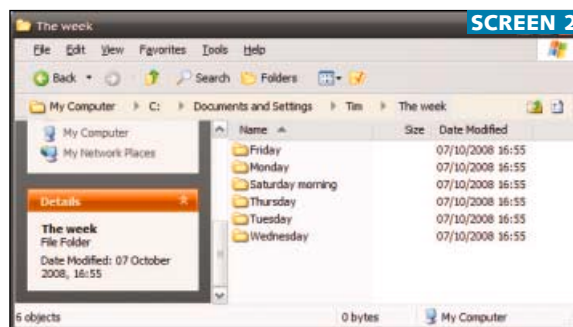
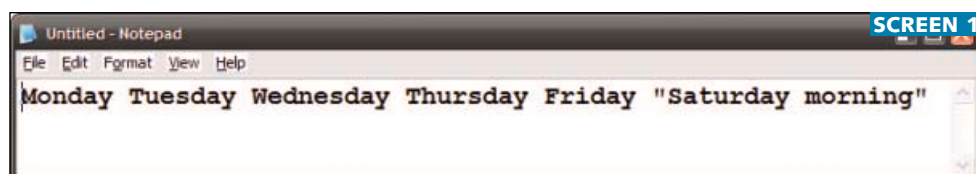
Last month we mentioned that the command prompt interface was alive and well in Vista. If you think this is just for the nostalgic, think again. There are many things you can do at a command prompt that are either more difficult or impossible in Windows. For example, try getting a list of the contents of a folder as a text file from the GUI – you can't without third-party software.

To take a real-world example, reader Brian Ward organised his work into a separate folder for each of his clients. He wanted to copy the folder names – but not the contents – as text, and then import the names into a spreadsheet, with each client name on a separate row.

If you had a few hours to spare you could do this by highlighting each folder name in order, pressing F2 as if you were going to rename it, pressing Control & C to copy the name then pasting it into a text file. From the command prompt it takes a few seconds. Open a command prompt in the parent folder, as we discussed last month, then type

dir /ad /b /on > clients.txt and you'll get the information you want in the file clients.txt. So what does the incantation mean? Dir produces a directory listing. The /ad switch tells the command just to return results that have the Attribute of being a Directory – in other words, just folders, not files. The /b switch displays a Bare listing – just the names with no size, date or other information, and the /on switch Orders, by Name. The chevron symbol redirects the output to the named file, which is created on-the-fly, and can then be imported into a spreadsheet or word processor.

Slightly more challenging is doing the converse. You have a list of names (or months, weekdays or whatever) and you would like to create an empty



folder for each one. The good news is that the MKDIR (Make Directory) command – or MD for short – can take multiple arguments. For example **MD Monday Tuesday Wednesday** will create three new folders with those names within the current folder. If you want one or more of the folder names to contain spaces, enclose the item in double quotes, making sure these are Notepad-style straight quotes (ANSI 0034) rather than 'smart' left- and right-handed quotes (ANSI 0147, 0148). For example, **MD Thursday "Friday Afternoon"** will create two, rather than three folders. Unfortunately you can't direct MKDIR to take input from a file, but what you can do is paste. So, get your list of names, each separated by a space, with double-quotes round any that have a space in them and make sure there are no line breaks (see screen 1). You may need to deploy your word processor's search and replace feature to replace all paragraph marks and line breaks with spaces. Having done this, select the list and copy it to the clipboard. Switch to the Command Prompt window, type MD, then click on

TOP: Pasting this to the MD command...

BOTTOM: ... gives you this

the icon at the left of the title bar. From the system menu that appears, click on Edit, then Paste. Press Enter and you should have the whole bunch of folders created instantly (see screen 2).

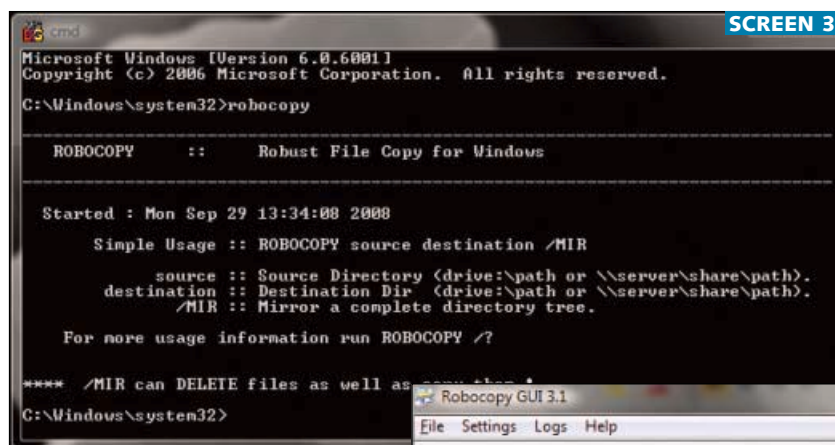
To create a set of nested folders, such as `Vertebrates\Mammals\Cats` MKDIR will handle this too, creating any folders that do not already exist in the chain. Command extensions must be enabled for this to work: they should be enabled by default, but if not you can force the issue by running CMD.EXE with the /E:ON switch. You can even combine the two tricks **MD Vertebrates\Mammals\Cats** **Vegetables\Brassica\Brussel Sprouts**

(Key: ↵ code string continues)

for example, will create the two chains of nested folders.

Vista specific

Although those commands work in XP as well, last month we promised some new command-line tricks in Vista. So, step up, Robocopy. The 'Rob' part stands for 'Robust' and it is designed as a tool for copying entire folders (including subfolders and contents), rather than files. It also isn't new, as it was previously included in the Windows Resource kit, but only became part of the OS with Vista and Windows Server 2008. It has several interesting features, two of which are the ability to copy files the administrator does not have permission over, and the ability to mirror a folder with the /MIR switch. This, as screen 3 warns, can delete files as well as copy them. This means that if you have already copied



SCREEN 3

Vista's clever
copier...

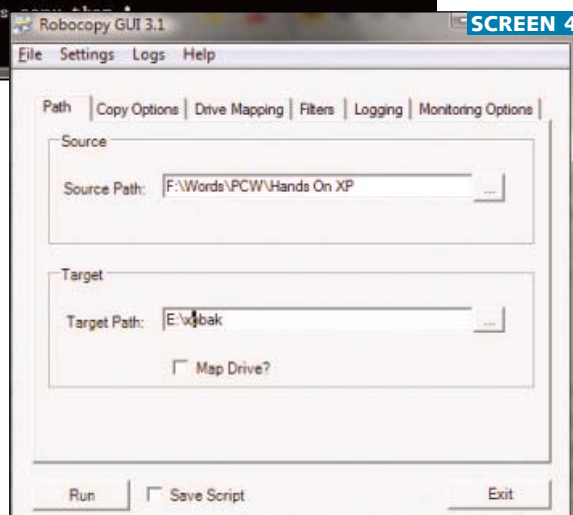
... now with a
GUI interface

a folder or folders, and then deleted files from the source folders, a subsequent Robocopy will delete the corresponding files from the destination folders. It's fast and there is a plethora of other switches, including ones to take parameters from, or save them to, a JOB file. You can see all of these with the usual /? switch. There's also a GUI interface available as a separate download from Microsoft (see screen 4). You'll find it at www.tinyurl.com/y7cybx.

Tooltip trickery

A common annoyance in XP is that the Taskbar tooltips stop appearing, affecting running tasks, Quick Launch items, System Tray icons and whatever else you may have there. What is happening is that they are popping-up, but behind the Taskbar – you can sometimes just make out the top of a tip – as Windows has its 'Z-order' in a twist, with both the tips and the Taskbar competing for top billing. There's a Microsoft Knowledgebase article – 912650 – that rather lamely admits that 'this is a known issue' and that you should either log off and back on or restart your computer. One cause of this seems to be right-clicking on a start menu item, and there is a widely held theory that going to All Programs, then right-clicking on an item and 'Sort by Name', cures the problem, though you may have to do this twice. Taking a small and totally unrepresentative sample, we found this worked on XP Pro SP2 but not SP3. Logging off and on did work as did stopping then restarting the Explorer.exe process in Task Manager, but both these fixes are rather tedious. Other 'cures' that probably won't work include moving the Taskbar or changing its 'on top' status.

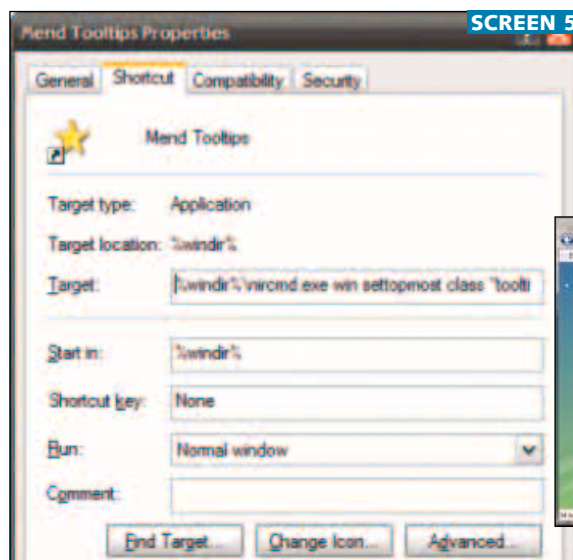
Tool Tip Manager (www.tooltipmanager.com) provides a tool to solve this problem, as well as customise



SCREEN 4

tooltips, but although it's only \$9.95 (£6), you have to buy before you try, which is counter to the philosophy of this column. Neosmart – the people who brought you the EasyBCD Vista boot manager – have a specific solution with Tooltipfixer. It's free from www.tinyurl.com/5ffdnf. You will need the .NET framework and you will find that Tooltipfixer – which has to run constantly as a service – takes 6MB of memory. Yet another solution lies with the prolific Nir Sofer's Nircmd from www.nirsoft.net – we mentioned

A quick fix for
hidden Tooltips



SCREEN 5

his ShellExView utility last April. Nircmd takes us back to where we began this month, as it is a command-line utility. Copy the executable to your Windows folder and you'll be able to accomplish a range of tasks from opening a CD Drive tray to taking a screenshot after a specified delay and saving it to a folder. In short, it's a tinkerer's paradise, but the command that deals with the current problem is `nircmd win settopmost class "tooltips_class32"` < "tooltips_class32" > 1

You can, if you want, type all this in to a command prompt, but unless you like typing, it's more convenient to create a shortcut with the entire command as the target. Give the shortcut a name and icon, save it in your Quick Launch folder and you have an instant fix for the problem (see screen 5). Although it's not permanent – the problem will recur if you right-click on a Start Menu item again – it is a one-click, no-overhead solution. And you can have all that fun opening and closing the CD tray or taking timed screenshots.

Weirdness corner

Reader Peter Henderson had a strange problem that had us baffled. His Vista Control Panel, in Classic View, showed a number of duplicate icons. These lacked labels, didn't appear to do anything and couldn't be deleted. After meddling in the Windows\System32 folder (don't do this at home, readers) we think we cracked it. If you right-drag a .CPL file, and choose Copy, you'll get first, a file named, for example, 'Timedate – Copy.cpl', and second, a duplicate, unlabelled, non-functioning icon in Control Panel. Screen 6 shows the results of copying timedate.cpl (Date and Time) and intl.cpl (Regional and Language). Unless you have User Account Control disabled it is hard to create these 'phantom' duplicates, but then, stranger things happen. The solution is to delete the file copies and the phantom icons will vanish. **PCW**



SCREEN 6

The Phantom of the Control Panel

XSPC

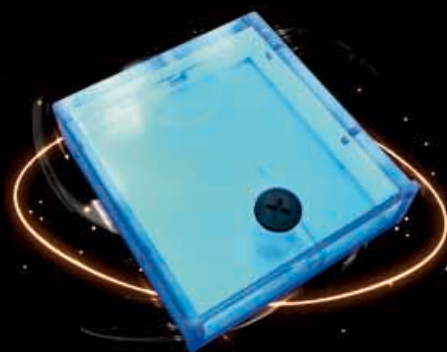
Performance PC Water-Cooling



WHAT IS WATER-COOLING

Water-cooling is a replacement for the traditional heatsink and fan used in PC's. Due to the increased heat output of modern processors, aircoolers can struggle to cope. Water has around 23x the thermal conductivity of air which makes it perfect for cooling high end CPU and GPU's.

In a watercooled system water is pumped to the CPU waterblock where it heats up and then to the radiator where it's cooled back down. All the components are connected in a closed loop in the same way a cars cooling system works.



WHY WATER-COOL

The main advantage of water-cooling your PC is lower temperatures, reducing the temperature of chips can help you achieve higher clock speeds and stability when overclocking. As well as the superior cooling watercooling offers reduced noise levels and great aesthetics.

Not all water-cooling is the same, in a recently published product review an XSPC kit performed 15°C better than a high end air cooler. In comparison CoolIT, NorthQ, Coolermaster and Thermaltake kits performed over 20°C worse than the air cooler, a difference of over 35°C.



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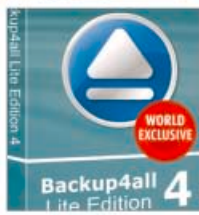
5 FREE PROGRAMS WORTH £124
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File Recover
Easy-to-use file recovery and undelete program. **WORLD EXCLUSIVE**



Photo Commander
Superb all-in-one photo-editing tool. **WORLD EXCLUSIVE**



Backup4All Lite Edition 4
Easily back up & restore your files. **WORLD EXCLUSIVE**

PC Tools File Recover 7*
Recover lost or deleted files in a flash

Ashampoo Photo Commander 6*
Superb all-in-one photo-editing tool

Backup4All Lite 4*
Easily back up & restore your files

MixVibes 6 Home
Import and mix music tracks to a professional level

SlovoEd Compact Oxford English-French Dictionary*
Translate between English and French using your Windows Mobile phone

* Requires online or phone registration

disc **ALL VISTA COMPATIBLE** **Personal Computer World**

Let our workshops on the following pages show you how to use some of the software on the CD and DVD

COVER DISC

10 FREE PROGRAMS WORTH £151
PLUS OVER 200 TOOLS, UTILITIES & DEMOS!



File Recover
Easy-to-use file recovery and undelete program. **WORLD EXCLUSIVE**



Photo Commander
Superb all-in-one photo-editing tool. **WORLD EXCLUSIVE**



Backup4All Lite Edition 4
Easily back up & restore your files. **WORLD EXCLUSIVE**



EASEUS Partition Manager Professional
Powerful hard disk management

PC Tools File Recover 7*
Recover lost or deleted files in a flash

EASEUS Partition Manager Professional
Powerful hard disk management

Ashampoo Photo Commander 6*
Superb all-in-one photo-editing tool

Backup4All Lite 4*
Easily back up & restore your files

PLUS
MixVibes 6 Home
SlovoEd Compact Oxford English-French Dictionary (Windows Mobile phones)*

LINUX & OPEN SOURCE
Ubuntu 8.10 - brand new version!

* Requires online or phone registration

ALL VISTA COMPATIBLE **DVD ROM** **Personal Computer World**

HELP LINES

WEB:
www.pcw.co.uk/disc-support

EMAIL:
disc-support@pcw.co.uk

PHONE: 020 7316 9706
(10am to 6pm Mon-Fri)

Note that we cannot give support for programs on the disc

SOFTWARE LISTING

ON THE CD

5 FULL VERSIONS

PC Tools File Recover 7
Ashampoo Photo Commander 6
Mixvibes Home 6
Backup4All 4 Lite
SlovoEd Compact English French Dictionary

33 FREWARE PROGRAMS

Artweaver 0.5.5
AVS Disc Creator 3.31.337
Azureus 4
Comodo Backup 1.0.4
Crossloop 2.3.1
CSE HTML Validator Lite 9
Desk Drive 1.6.6
Eusing Free Registry Cleaner 2.0
Firefox Backup Extension 6.0.3
Flock 2.0
Floola 3.6
GIMP 2.6.1
Google Chrome 0.3.154.3
Google Desktop for Windows 5.8
Googlepreview 3.15
iQ-Notes 3.70
NSIS 2.40
Openedfilesview 1.26
PC Tools Antivirus Free Edition 5.0.0.22
PC Tools Threatfire 4.0
PFRank 2.24
Pictomio 1.2
Pidgin 2.52

Quicksys Regdefrag 2.1
Revo Uninstaller 1.75
Skype 4.0 Beta 2
SMART Disk Monitor 8.0.0.19
Softmaker Office 2006
Soundbase 2008.10.10
Task Coach 0.71.1
Ultradefrag 1.4
USBdevview 1.26
VLC Media Player 0.9.4

12 FROM THE MAGAZINE

Agnitum Outpost Security Suite Pro 2009
Bitdefender Internet Security 2009
Bullguard Internet Security 8.5
iolo System Shield 3.1
Kaspersky Internet Security 2009
Media Player Classic 6.4.8.9
Mediainfo 0.7.7.7
Microsoft Windows Live OneCare 2.5.2900.18
Musicbrainz Tagger 0.10.5
PC Tools Internet Security 2009 v6.0.0.383
Tag&Rename 3.4.6
ZoneAlarm Internet Security Suite 2009

18 SHAREWARE PROGRAMS

Advanced Uninstaller Pro 9.5.2
AuctionX2 1.1.0.56
Beyond Compare 3.0.8
Faststone Capture 6.3
Folderlock 6.05

Goodsync 7.5.2
HTMLpad 2008 Pro 9.2
Notezilla 7.0.84
Offline Explorer 5.2.2847
Powerarchiver 2009 11.01
Rapid CSS Editor 2008 9.2.0.99
Rapid PHP Editor 9.2
Robotask 3.2
SMART Disk Monitor 8.0.0.17
Vistatask 7.330
WinRAR 3.8
Worktime 4.13
Wpanorama 9.2.1

4 TRIAL PROGRAMS

Badaboom Media Converter 1.0
Paragon Drive Copy 9
Portrait Professional 8
Webroot Spy Sweeper 6

ON THE 8GB DVD

EVERYTHING ON THE CD PLUS...

1 FULL VERSION

EASEUS Partition Manager Pro 2.1

3 FREWARE PROGRAMS

Evernote 3.0.0.788
MDaemon Free
Studioline Photo Basic 3.50.54

4 LINUX & OPEN SOURCE PROGRAMS

Mandriva Linux One 2009
NetBSD 4.0.1

Parted Magic 3.1
Ubuntu 8.10

4 TRIAL PROGRAMS

ACDsee Photo Manager 2009
Acronis True Image 2009
ACDsee Photo Manager 2009
Acronis True Image 2009

4 FROM THE MAGAZINE

Norton 360 2.0
Panda Internet Security 2009
Trend Micro Internet Security 2009
AVG Internet Security

RESOURCES

(OVER 100 APPS, 11 CATEGORIES)

Audio, Video & Photo
Backup & Restoration
Browsers, Managers & Extensions
Burning & Media
Business & Office
Developer & Web Development Tools
General Utilities
Internet & Networking Tools
Optimisation & Diagnostics
Portable Applications
Security

4 GAME DEMOS

Lego Batman The Videogame
Madagascar 2
Motorm4X
Quantum of Solace The Game

THE UK'S BIGGEST & BEST SOFTWARE COLLECTION!

USING THE COVER DISC

The PCW cover disc uses a web browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs, so you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

STARTING THE DISC

The CD-Rom (or DVD) should auto-start. If it fails to do so, double-click the CD-Rom/DVD icon in My Computer or open the terms.htm file on the root of the disc.

PROBLEMS?

We cannot give support on programs on this disc. If you have problems running the disc, follow these guidelines:



PROBLEMS INSTALLING/RUNNING THE SOFTWARE

Check the support page on the disc or check the manufacturer's site.

GENERAL DIFFICULTIES

For details on cover disc support and frequently asked questions about the discs go to www.pcw.co.uk/disc-support. For faulty or damaged CDs/DVDs please email disc_support@pcw.co.uk for a replacement, giving the details requested on the website. If you have no internet access, call 020 7316 9706 between 10am and 6pm Monday to Friday. Please note that PCW cannot give technical help/support.

General licence restrictions, January 2009

These products are licensed for personal use on only one PC at a time. You may not rent or lease or resell products contained on this DVD or use them for public performance. Neither the suppliers nor the publisher will accept responsibility for any losses or damage resulting from use of this software, including any loss of profit, damage to equipment, interruption of business or data or any other damage direct or accidental.

It is recommended that you back up any programs and data on your hard disk before installing this software.

PLEASE READ INSTALLATION AND SYSTEM REQUIREMENT INSTRUCTIONS CAREFULLY BEFORE USING.

The publisher, Incisive Media, has checked this DVD-Rom for known viruses at all stages of production, but you are advised to check all programs and discs accessed on your PC yourself before using them, with an up-to-date virus scanner.

No part of this DVD-Rom may be reproduced without prior permission of Incisive Media.





INFORMATION

System requirements Windows 2000/XP (32-bit)/Vista (32-bit), 16MB disk space

Contact www.pctools.com

Registration Launch the program and click Register > Register Free, or point your browser at www.pctools.com/en/file-recover/free/promo/INCISIVE0109

PC Tools File Recover 7

Recover lost files in a flash with this essential data recovery tool

Very few PC problems are really urgent. It's annoying if your hard drive is almost full, your internet connection horribly slow, or your PC keeps crashing with inexplicable blue-screen errors, but if you put off addressing these issues for an hour or so, then it's not going to make any difference. Nothing will really change.

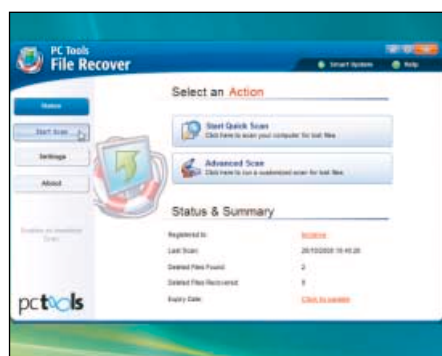
Accidentally delete a file, though, and it's a very different story. If it has not made it to the Recycle Bin, then every disk write your PC carries out could corrupt your document beyond any hope of recovery. Wait for an hour, play a game, even go online to download a file recovery program and you're putting the file at risk.

Fortunately, there's an easy way to avoid this kind of trouble: install PC Tools File Recover 7

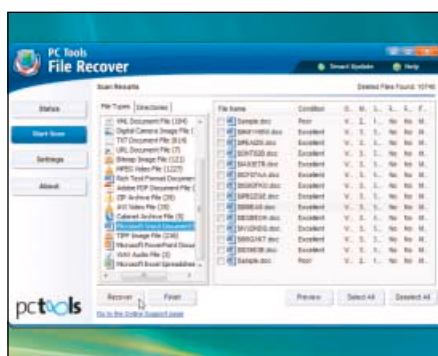
before you actually need it. If the worst happens, you can turn to the program immediately, have it scan your system and report on all the deleted files it can find. Browse through the folders, locate your missing data, click Recover and it will be restored quickly.

Of course, if you meant to install the program, but never quite got around to it, then life may not be quite so easy. But there's still hope, even in this situation. Install it now, choose File Recover's Physical Scan option and it'll crawl over every sector of your hard drive's free space, using an in-depth knowledge of file structures to identify your data. This technique can help the program detect missing documents even if their file system directory entries have been overwritten, and gives you the best possible chance of data recovery success.

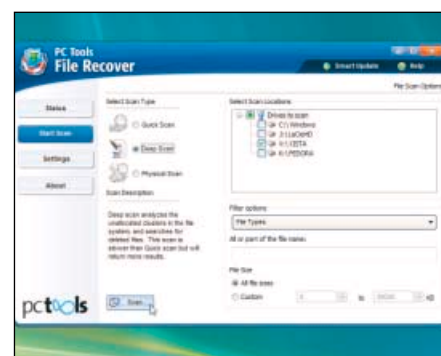
Recover lost files in three easy steps



1 Launch PC Tools File Recover 7 and you'll see a 'Start Quick Scan' option. Sounds good, but it's not the one you want, even if you're in a hurry. Click the Start Scan button on the left, choose Quick Scan, select the drives to scan, and optionally enter the type of file you'd like to recover and all or part of its name. Click Scan to begin.



2 Click No when you're prompted to run a Deep Scan and take a closer look at the scan results. Browse by file type or directory, whichever is easiest, and look for the file or files that you're trying to recover. If you find one, select it and click Recover to restore your data. Ideally recover it to a separate drive so you don't overwrite anything else.



3 If your file wasn't there, then that probably means its file system directory entry has been overwritten. Click Finish, check Deep Scan and click the Scan button. PC Tools File Recover 7 then directly searches all the free clusters on your hard drive, a much slower process (so be patient) but one that could still recover your lost data.

READER OFFER

GREAT PROGRAMS

Real-time spyware protection
Clean and optimise the Registry
Powerful anti-virus engine
Clear your internet tracks
Free your inbox from spam
All-in-one system optimisation

SAVE 20% ACROSS THE PC TOOLS RANGE

This is the very latest version of PC Tools File Recover, so there's no upgrade deal available, but if you find the program useful there are plenty of other PC Tools applications you might like to explore. For example, Registry Mechanic will repair and optimise your Registry; Spam Monitor will keep the junk out of your inbox; and PC Tools Internet Security 2009 combines anti-virus, anti-spyware, firewall and spam protection in one powerful package. Prices start at around £20, and you can save 20 per cent off any of these products by following the links at www.tinyurl.com/65bhdv.



INFORMATION

System requirements Windows XP/Vista (32-bit), 50MB disk space

Contact www.ashampoo.com

Registration Leave 'Get full version key' checked during installation, or click Internet > Switch to full version for free > Obtain your free full version code

Ashampoo Photo Commander 6

Organise, enhance, edit and share your favourite digital photos

Most digital photo organisers do little more than combine the image previewing features you already get in Windows Explorer with a few underpowered editing options, then pretend they've created something worthwhile. There are some noticeable exceptions, though, and Ashampoo Photo Commander is one of the best.

Its thumbnail browser allocates enough space to display useful summary information (file name, size, date, resolution) on each photo, so it's easy to find what you need. It supports audio and video files along with your photos, and provides some powerful file management tools. The batch rename and convert tools alone could save you hours of work.

The editor has features you might actually want to use, including the ability to fix skewed

photos, remove red-eye, and optimise colour and contrast with a single click. You can also add captions, arrows, shapes and so on, saving them as objects rather than bitmaps so you can come back later and change the font of a caption, say, without affecting image quality.

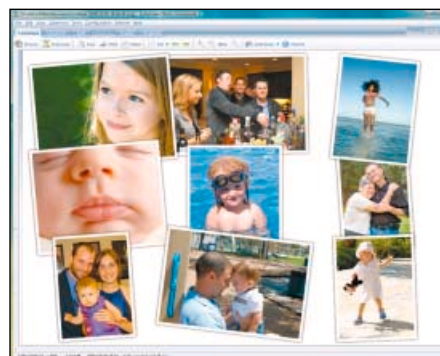
There are options to build a calendar, photo collage or greetings card. Photo Commander can generate all the HTML and thumbnails needed to build a web image gallery, or create a standalone slideshow with fancy transition effects and soundtracks, then burn the results to CD.

And there are more excellent bonus features, from a tool to locate duplicate images even if they've been resized or edited, to a powerful screen grab option. If you're at all dissatisfied with your current image management tools, then Photo Commander is well worth a look.

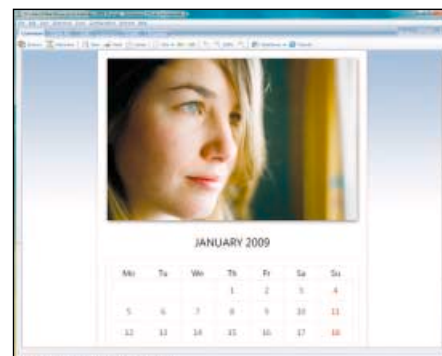
Turn ordinary photos into art with Photo Commander's creativity tools



1 Sometimes a simple border is all it takes to transform an image. Double-click on a photo and click Create > Frame/Card to see what's on offer. You could place your shot in a greetings card in a couple of clicks, but we prefer the Shapes options – this smoky style is particularly effective.



2 When you'd like to share a number of photos we recommend you create a photo collage. Choose the images you need, click Tools > Create Collage > Next and preview the results. No good? Click Reorder Photos, or select a different collage style, background colour or orientation for a different look.



3 If you're happy with your photos as they are, then why not pick the best 12 and create a custom calendar? Just select them in the browser, click Tools > Create Calendar, and move them into the required order. Click Next, choose the calendar style and year, click Next, and watch as Photo Commander generates each page.

UPGRADE OFFER

NEW FEATURES

**COMING
SOON**

SAVE 75% ON PHOTO COMMANDER 7

At the time of producing this issue, Ashampoo Photo Commander 7 was still unavailable. It should be available to purchase by late November 2008 and details about the new features will be available from the Ashampoo website. The list price for the new version is £34.99, but as a registered owner of Ashampoo Photo Commander 6 you need only pay £7.49, a very generous 75% discount. Click Internet > Upgrade... to find out more.



INFORMATION

System requirements Windows 2000/XP/Vista (32-bit), 15MB disk space

Contact www.backup4all.com

Registration Obtain your registration details from www.backup4all.com/free-registration.php?src=85

Backup4all Lite 4

Protect yourself from data disasters with this backup tool

Backing up your most valuable data will always be a hassle, but at least Backup4all Lite 4 gets the whole tedious business over with the maximum possible speed.

The Backup4all Lite advantages start with the well-designed interface. The straightforward backup wizard walks you through all the key options you need, each of which have sensible default settings. As a result, you can create a backup job to save your My Documents folder (for example) in something less than a minute. You almost certainly won't need to check the help file, either, although it's good to know that there's quality documentation available if you need it.

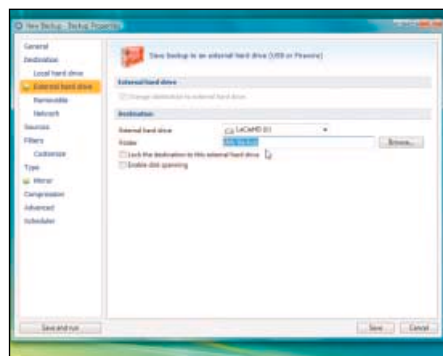
The program includes predefined backup choices to reduce the time you spend hunting for files and folders. Perhaps you would like to

save your Firefox profiles and Thunderbird mail – just choose those options from the list.

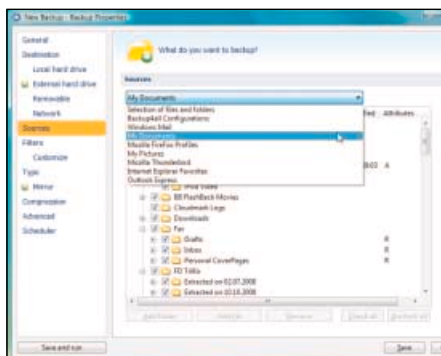
Of course, you can also specify particular files and folders to back up, if that's more convenient. And customisable filters give fine control over your backup contents so, for example, you're able to ignore executable file types like DLL or EXE, while including common document formats such as DOC, XLS or PPT.

Backup4all Lite 4 can back up to local, external, network or removable drives, and if you switch to the program's advanced mode then you'll find plenty of additional controls over what's transferred. Would you like the backup to preserve NTFS security permissions but lose any alternative file streams, say? These, along with other file sorting, splitting and spanning options, are all available in a couple of clicks.

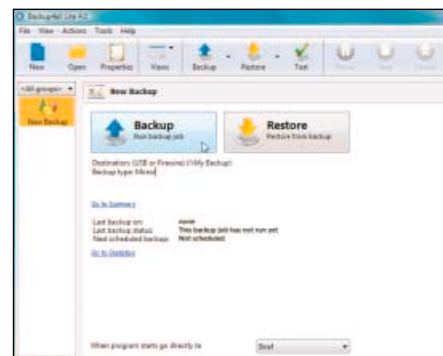
Create a useful backup job in less than 60 seconds



1 Launch Backup4all Lite 4, click New to define a new backup job and select Advanced Mode to see every option the program has to offer. Enter a sensible name for the backup and choose where you'd like to save it. Local, external and network hard drives are supported, and you can even use a USB flash drive if that's more convenient.



2 Click the Sources tab to decide what you're going to back up. You could use the Add Folder and Add File buttons to specify anything you like, but Backup4all Lite 4 includes some useful predefined folders that might save you a little time. If you'd like to back up your Documents folder, say, then just choose My Documents from the list.



3 Click Advanced on the left, and if you don't want the backup to interrupt other PC processes, then set it to run at a low priority. The other backup settings can be left at their defaults, so click Save to save the backup job, then Backup if you'd like to run it now. Right-click the job and select Properties if you'd like to change its settings later.

UPGRADE OFFER

NEW FEATURES

- Supports full, differential, incremental backups
- Backs up directly to CD/DVD
- Version tracking
- Powerful backup scheduler
- ZIP64 support
- Run custom action before/after backup

SAVE 33% ON BACKUP4ALL STANDARD

Backup4all Lite 4 is a good backup option, but Backup4all Standard is even better, adding more backup types (full, differential, incremental), support for backing up to CD or DVD, and a backup scheduler. The Standard edition of the software can launch whatever program you like both before and after a backup, while version tracking allows you to selectively restore any previous version of a file that has been backed up. You'd normally pay around £35 for the Standard version, but follow the Order Now link on the registration page (www.tinyurl.com/5azxc6) and it can be yours for around £28.

Mixvibes 6 Home



INFORMATION

System requirements Windows 2000/XP/Vista (32-bit), 15MB disk space

Contact www.mixvibes.com

Registration To register the program, type SF7VU-24ZJH-FSYVK-LFHG7-F5WVH in the Code box during installation

BPM matching and multiple cue points make it easy to produce top-quality mixes

It's easy to create a party soundtrack on your PC. Just use your media player of choice to generate a suitable playlist, and you're done. But if you really want to impress people then you'll get much better results from Mixvibes 6, a DJ media player that provides everything you need to create a custom mix of your favourite tunes.

The process starts by reading in your music files. Click File > Scan, point Mixvibes at your music folder, click OK and the program will import any files it discovers. Click in the list of media files, press Ctrl&A to select them all, then right-click one and choose Analyse. And watch as Mixvibes calculates the average beats per minute (BPM) for each of your songs.

Click the BPM column header to sort the files into beat order, and find two songs with a similar beat that you think will work well together. Drag and drop one to the first player, the other to the second, and you're ready to go. Click Play on the first, then start the second tune whenever you like and listen to the results.

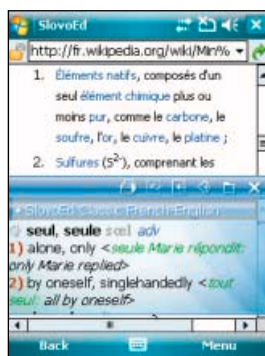
There are plenty of tools to help you get the mix just right. You're able to set up multiple cue points to start playback at the points you need, create custom loops, vary the tempo and tone, play with the equaliser, tweak the volume, and use the crossfader to switch the balance from one track to the other, then record the finished results to a WAV file at the click of a button.

UPGRADE OFFER

SAVE £20 ON MIXVIBES PRODUCER

Mixvibes Producer extends the Home version by providing up to four players, each of which can play digital music, or connect to a CD player or turntable (with a suitable sound card). Extra tools let you mix multiple video clips, add video effects or transitions, and send the output to a secondary monitor or projector. There's an enhanced 16-pattern sampler, VST instruments and effects, Midi learning, and a lot more. Visit www.tinyurl.com/6n8572 for the full feature list, and to order the complete package at a cost of around £213.

Slovoed English-French Dictionary



INFORMATION

System requirements Windows Mobile, 2.64MB Ram, or Symbian S60 3rd Edition Smartphone

Contact www.penreader.com

Registration Point your browser at www.penreader.com/promo/vnu_slovoed.html

Polish your language skills anywhere with the Slovoed dictionary

If you're planning a trip to France but haven't spoken a word of the language for years, a refresher course will help. And there are few better tools than the Slovoed Compact English French Dictionary. If you've a suitable Windows Mobile device (5.0 Pocket PC, 6 Classic and Professional, 6.1 Classic and Professional) or a Symbian S60 smartphone, you can install it and practice your skills anywhere.

At its simplest you can just browse the dictionary to expand your vocabulary. Add a word you really need to remember to a flash card and have the program test you later. The dictionary tracks your responses, and the more

often you give the right translation, the less likely it is to ask you about that word again.

Of course, finding a French word isn't easy if you don't know its exact spelling, but support for wildcards makes it much easier to find what you need. Then the Morphology module will help you translate the word correctly in any grammatical form: plural nouns, adjectives, different verb forms and so on.

A Resident module allows the program to work with other applications. If you're trying to read a French website, perhaps, you can run its pages through the Resident module for a quick and accurate translation.

UPGRADE OFFER

SLOVOED DELUXE ENGLISH-FRENCH DICTIONARY

The Deluxe edition of the Slovoed French-English dictionary adds new definitions, usage samples, synonyms and antonyms, references and other important information. But the best part of all is the sound module, which includes 20,000 audio samples of words spoken by native French speakers, and so helps you learn accurate pronunciation as you build your vocabulary. The price is very reasonable at around £39, and you can read more about it or place your order at www.penreader.com.



INFORMATION

System requirements Windows 2000 Professional SP4/ Windows XP (32/64-bit), Windows Vista (32/64-bit), 63MB drive space

Contact www.partition-tool.com

Registration Not required

Easeus Partition Manager 2.1

Create, move or resize partitions with this drive management tool

Dividing a hard drive into partitions offers all kinds of benefits. It lets you install multiple operating systems, so you might, for example, be able to boot from Windows XP and Vista on the same PC.

Partitioning lets you organise files in new ways, perhaps leaving Windows on drive C:, installing applications on D: and saving your data to E:.

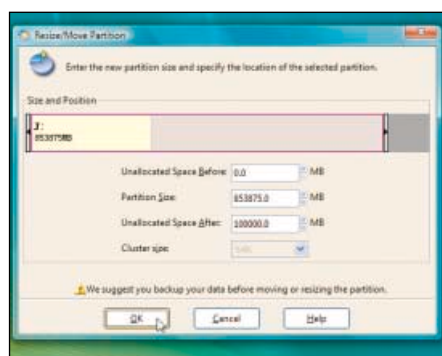
And that kind of hard drive arrangement can simplify and speed up other system tasks. If you're running a backup, say, then there's no longer any need to trawl through your hard drive looking for documents. Just point the program at your data partition and the job is done.

You could try to partition your drive with Windows' own utilities, but we don't recommend it. They're just too limited, and you're far better off using a specialist tool such as this.

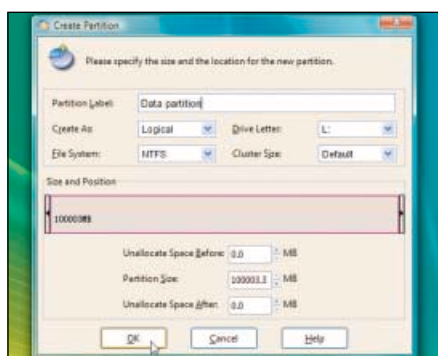
Install and run Easeus Partition Manager Professional Edition and you'll see a map showing how your drives are currently set up. Most PC hard drives arrive with a single partition, but this is easy to change. Ask the program to shrink the existing partition, then create a new one in the unallocated space, assign it a drive letter and it's ready to go (see the walkthrough), even if you're currently using hardware Raid.

Easeus Partition Manager Professional Edition can also help if your existing partition table becomes corrupted and your PC will no longer boot. Click Tools > Create Bootable Disk, follow the instructions and it will create a bootable CD or DVD with a standalone version of Partition Manager. If your PC won't start, then boot from this instead and you'll find a range of partition tools to help you recover.

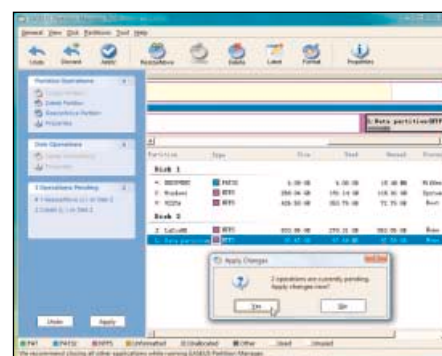
How to create a new hard drive partition



1 Launch Easeus Partition Manager Professional Edition and locate the drive you'd like to partition on its disk list. Right-click the existing partition, select **Resize/Move**, and enter a smaller partition size. If you'd like to create a new 100GB partition, say, then reduce the existing partition size by 100,000MB. Click **OK**.



2 A new 'unallocated' area will now be listed under that disk. Right-click this, select **Create**, and give your partition a name. Easeus Partition Manager will automatically choose a file system, drive letter and cluster size for you, but these can all be changed if you've a good reason to do so. Then click **OK**.



3 You should now see the new partition, complete with its drive name, listed under the disk. But this is just a simulation showing how the changes will affect your drives, once complete. If you're happy with the results then click **Apply** > **Yes**, click **Reboot** if asked and your new partition will be created.

UPGRADE OFFER

NEW FEATURES

Supports Windows 2000 Server
Supports Windows 2003 Server
Handles up to 32 hard drives

EASEUS PARTITION MANAGER SERVER

Easeus Partition Manager Server Edition takes all the partitioning power of the Professional Edition and adds to it the ability to run on Windows 2000 Server Security Pack 4, and all flavours of Windows Server 2003 (that's Standard and Enterprise, in both 32-bit and 64-bit). And with support for up to 32 hard drives, Partition Manager Server Edition will cope with even the most powerful server setup. The program costs just under £100, and you can order it directly from www.partition-tool.com.



Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time he prefers to travel the world – and snap it with his camera.

→ Comments welcome on the Linux/Unix column.

Email linux@pcw.co.uk

Please do not send unsolicited file attachments.

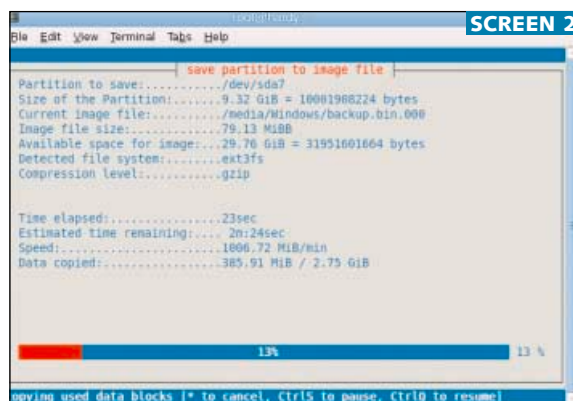
Backup and restore

Find out how to back up and restore your disk partitions in Linux

Last month we saw how it's possible to make a complete copy of a partition using the standard Unix `dd` tool, and how this is useful to back up an entire filesystem, no matter which type it is.

This month we are going to look a little more into this area, at a couple of other tools that can come in handy and how to detect problems with your hard drive.

As we saw last month, the major benefit of using `dd` is that it duplicates every single raw byte of data on the partition (be it a traditional hard drive or USB stick), enabling you to restore it all again, preserving the original exactly. This also leads to a major drawback: when you duplicate a drive or partition in this way, the copy needs the same amount of space as the original. When the filesystem you wish to copy is full, this may not be an issue. But if you have a 500GB partition that has only 10GB of data in use, having to duplicate 490GB of empty data seems wasteful in terms of the storage requirement and the time it takes to copy such an amount.

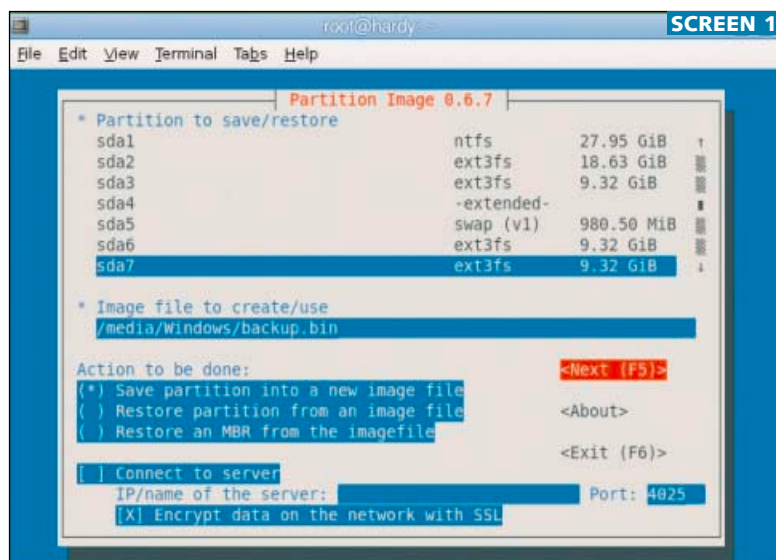


Partimage's progress screen while backing up a partition

Saving the used part of a partition with Partimage

Partimage

A tool that deals with this problem well is Partimage (www.partimage.org). This handles partitions superficially in a very similar way to `dd`, in that it can create an image file from a partition which can then be restored later. The advantage it has here is that Partimage copies only the data that is in use on the filesystem. With that 500GB partition, the resulting image will be 10GB (with perhaps a small overhead). Naturally, since only used data is being copied from the partition,

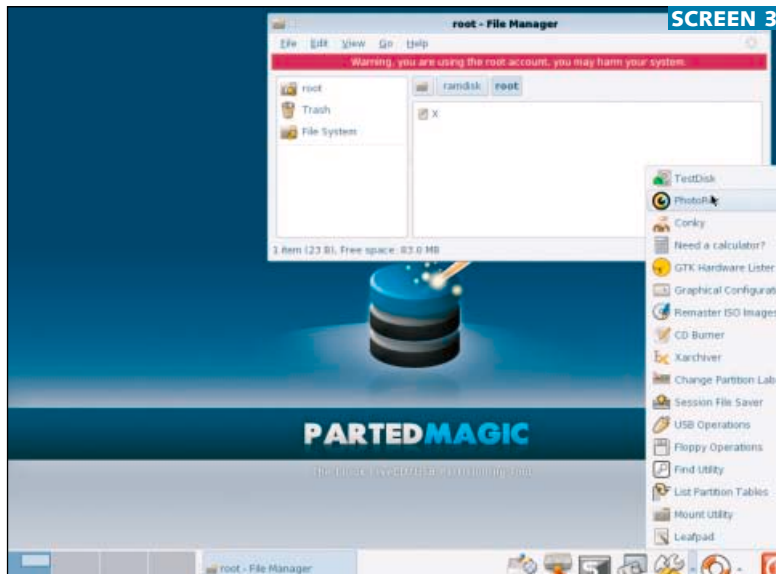


is commonly found on USB sticks and older Windows installations. Additionally, the image that Partimage creates tends to be very suitable for compression with standard Linux methods, like `gzip` and `bzip2`, and this facility is built into the Partimage application.

Partimage is a menu-driven terminal-based application, and as such is run from the command line. Despite not having a modern graphical interface, it is very easy to use. Enter 'partimage' at the shell prompt to start it up. The tool needs direct access to storage, so you will almost certainly need to be logged in as root to use it. Screen 1 shows a list of partitions found, in the usual `/dev/sda`, `/dev/sdb` style. Each entry lists the filesystem type and the size of that partition. Use the tab key to switch to different sections of the screen; Shift & Tab can be used to go the other way. All that needs doing first is to choose whether to back up a partition or to restore from an image file, and to enter the path of the image file to create or use. When backing up there are a few more options. On the next screen, select the compression level to use: `gzip` is probably the best option; it is much faster than `bzip2` and will compress almost as well, in most circumstances. Now proceed to the final screen where Partimage will present a summary of information about the filesystem, including the amount of space used on the partition. Next, Partimage will begin copying the data, giving a progress indicator, as well as the current size of the image file for backups (see screen 2).

Caveats

Never try to back up or restore a partition which is in use, particularly the partition you are running your operating system from. For that



SCREEN 3

reason, Partimage needs the partition you are working on to be unmounted. This presents a problem if you want to back up or restore your operating system partition. The way around this is to use an alternative boot method, the easiest of which is a live CD. Here, since you are running the operating system entirely from a CD, you can work on any hard drive partition without restriction. There are several Linux distributions dedicated to this kind of task, and one good one is Parted Magic (www.partedmagic.com), see screen 3. This very small (50MB) distribution

partition data using dd, in the same way as you would clone the partition. This would be fine for a partition with filesystem errors alone, but it isn't so simple with hardware errors. The dd command would read as far as it could, and then stop with an error when it could not read the bad sector on the drive. There is an alternative to dd for situations like this, called ddrescue (see screen 4). There are in fact two different tools, each with the same name, but here we are looking at the GNU version of ddrescue.

This tool is very similar to dd, and in the case of there being no hardware

'Although ddrescue is designed for copying and recovering data from drives, it will also draw your attention to errors on the disk'

contains Partimage together with several other recovery tools, and is designed to work on older computers just as well as newer ones.

Disk errors

Sometimes a filesystem can become damaged or inconsistent, such as when there is a sudden power loss. These kinds of errors can usually be detected and fixed with standard filesystem tools, like e2fsck. Most distributions perform routine scans to check for problems like these. But if there is a hardware error on the disk drive itself (a bad sector), this can go undetected for a long time, and means the filesystem on the affected partition can never be fixed in place.

If you want to recover this data, you might try to extract the raw

errors on the partition, is effectively the same. In the case of an error, ddrescue does not fall over and stop. Instead it tries its best to recover as much data from the partition as possible. It also creates a logfile of its progress, so if it is interrupted, it can be resumed from where it left off. This is especially useful for less predictable hardware errors than unreadable sectors, as ddrescue can be run multiple times on the same partition to try to recover the lost data; it will fill the gaps in the recovery image file as best as it can.

To install ddrescue in Ubuntu, you must select 'gddrescue' to specify this particular version:

apt-get install gddrescue

The standard usage of ddrescue is mostly the same as dd, except there

Parted Magic, a distribution for setting up disks and rescuing files

are no 'if' and 'of' options. To copy or recover all the data from /dev/sda1 and put it into the file/backup/img.bin:

```
# ddrescue -v /dev/sda1 <
/backup/img.bin /tmp/reclog
```

(Key: < code string continues)

First comes the input file or device, then the output, and then the logfile. The logfile is optional, but it's always a good idea to create it. We're specifying the verbose (-v) option here to see additional information.

As above, ddrescue works as a drop-in substitute for dd, as without any errors on this partition a full copy is made. Ddrescue also has the advantage of potentially a small performance increase (due to the way it uses buffers).

Checking for errors

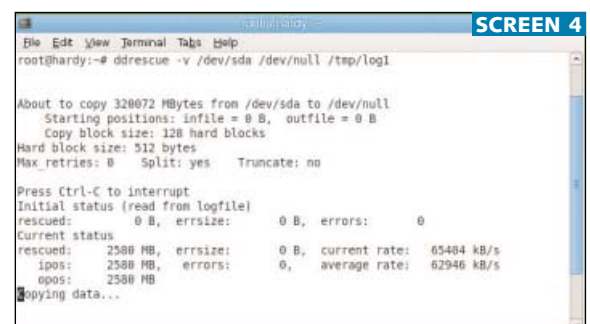
Although ddrescue is designed for copying and recovering data from drives, it will also draw your attention to any errors on the disk. Duplicating an entire disk to detect errors does not seem the most sensible way to go about this, and thankfully Linux's standard /dev/null device means it is not necessary. Anything sent to /dev/null is ignored, and so just specify this as the output device. You can check an entire drive, such as /dev/sda, in this way:

```
# ddrescue -v /dev/sda <
/dev/null /tmp/reclog
```

In this example, ddrescue will read all of the data from the hard drive without copying any of it. If there are any bad sectors on the drive, they will show up clearly. In this case, as no data is being backed up or restored, you may run it on a hard drive which is in use, although wait until there is little or no disk activity.

I advise running a command like this on a brand new hard drive, as bad sectors often don't show themselves until the drive begins to fill, especially with large drives. It is not necessary to run a check like this frequently; doing so would add unnecessary wear to the hard drive. **PCW**

Checking a hard drive for errors with ddrescue



SCREEN 4



Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

→ Comments welcome on the Digital imaging & video column. Email digitalimaging@pcw.co.uk Please do not send unsolicited file attachments.

Video in a Flash

We look at the creative side of Flash video for the web

In 2003, I wrote of the options available, and the pitfalls to be avoided, in producing streaming video for the web. The crux of the matter was choosing which video codec to use, important because if visitors to your website are to see your video, they need the right codec.

Additionally, there were container architectures and players to be considered – Windows Media Player, Quicktime, Real, or some other option. Whichever you opted for, you inevitably disenfranchised some percentage of your site's visitors. Platform and browser inconsistencies further complicated the situation and made it almost inevitable that your site would appear broken to some. The situation today is less complicated. There's really only one reason for that and it's called Flash video.

It might be considered surprising that an application that provided video support only relatively recently has gained such dominance on the web. Flash came from nowhere to be the number one choice for video distribution on the web – not because of its video features, but because it has for years been growing its installed base as a delivery medium for other rich interactive content.

By the time Flash added video to its already impressive array of features, it already had the highest installed base of any web media player, including Windows Media and Quicktime, making it the obvious choice for anyone wanting to deliver web video. That list now includes just about everyone from the BBC to Youtube.

You don't need Flash itself to produce Flash video. There are many advantages to using the Flash authoring application, which I'll get to, but there are also many alternatives. The most straightforward of these is simply to upload your existing video to



The BBC's iPlayer uses Flash video

a video hosting site such as Youtube or Motionbox. I looked at the features provided by several hosting websites in December 2008, so if you want to do it this way check out that issue.

Though their free accounts differ in terms of things such as space, HD support and editing facilities, most video-hosting sites have two things in common: they deliver your video in Flash format; and they automatically encode it for you on upload. So, they offer an extremely quick and cheap way to get your video online.

The drawback is that, although you can embed the video player in your own web pages, the hosting site branding and/or advertising will also be displayed, and you have to make do with their player application and skin. Some will allow you to download it to your hard drive, so you could use them as an online conversion service for a small amount of content.

There's another alternative that doesn't involve using Flash to author and encode your video. Many video-editing applications will output an .flv file. If you use a recent version of Adobe Premiere, Premiere Elements, or Final Cut Pro and Quicktime Pro on the Mac, you can

output .flv files. The screen video capture and editing application Camtasia Studio (see Hands On Digital Imaging, PCW, October 2007) has some excellent Flash video templates and produces all the files you need, including an HTML page. If you're looking for a no-cost option for converting existing video formats to .flv, and you're happy working with a command-line interface, try FFmpeg.

To stream, or not to stream

I'm not going to go into detail about encoding options here, except to say that in most cases you'll get the best results using H.264 and this is the only option if you want to deliver HD content. I've said plenty on the subject of encoding in general in past columns and, in essence, it comes down to making a size/quality trade-off that provides the best viewing experience given the viewer's connection speed.

Having produced your .flv, the next decision to be made is how to deliver it. You can opt for either progressive download or streaming. Progressive is the simplest to implement and is fine for short clips on websites that aren't going to get a lot of traffic.

A progressive download works like any other HTTP file request in that the entire video file is downloaded to the viewer's PC. Playback of the movie can be started as soon as sufficient content is buffered. You don't have to wait for the entire file to download. While adding a progressive .flv to a web page is straightforward, as seen in last month's Hands On Web Development, there are some disadvantages.

Because the download is linear, you can't skip to the end of the movie and watch, say, the last 10 seconds until the entire file has downloaded. And progressive downloading doesn't afford any kind of copy protection. Savvy users can locate the cached file

and play it back offline, add it to their own site, or breach your copyright in any other way that takes their fancy.

The alternative to progressive downloads is streaming. Setting up streaming delivery is more involved, but offers several advantages over progressive delivery. The most obvious from the viewer's standpoint is that a streaming server can monitor the connection speed and vary the quality of the video stream.

Streaming also makes it possible to seek – that is, to skip back and forth to view portions of a movie without having to wait for the entire file to download. This is particularly useful for longer movies and for tutorial videos, where you might want to skip the introduction or go back over a segment. Streaming provides copy protection because the entire file isn't downloaded to the viewer's machine and, of course, if you want to webcast a live event streaming is the only option.

On the downside, streaming Flash video is more complex to set up and more expensive than progressive delivery. Flash Media Streaming Server costs £981.12 and runs on Microsoft Windows 2003 Server Enterprise Edition and Linux.

An alternative to buying Flash Media Streaming Server is to sign up with one of the Adobe partner content delivery network (CDN) providers for the Flash Video Streaming Service (FVSS). You can find a list of CDN providers at www.adobe.com/products/flashmediaserver/fvss/.

Flash Video Streaming Services aren't confined to the Adobe partner organisations. Type Flash Streaming Server into your search engine of choice and you'll find there's no shortage of companies offering Flash video streaming. On-demand streaming is typically priced by storage capacity, with limits on monthly data transfer. As an example, flashstreaming.co.uk charges an annual fee of £499.99 for 1GB of space, with a monthly transfer limit of 50GB.

There are also software alternatives to Adobe's Flash Media Streaming Server. At \$995 (about £577), Wowza Media Server works out at about half the price of FMS, and there's a free version that includes all the features of the paid-for one, but has a limit of 10 concurrent connections.

Red5 (<http://osflash.org/red5>) is an open source Flash server written in Java that's gaining popularity and has a least one high-profile user in

What is Flash video?

Flash video is a container file format that can be played using the Adobe Flash Player and web browser plug-in. Some other players can also play back .flv files, including MPlayer, RealPlayer and VLC Media Player. Windows Media Player, winamp and some other media players can play back Flash video.

Directshow codecs are installed, and there

are many other open source and shareware players around, but by far the most common way to view Flash video is in a web browser.

Initially, Flash video was encoded using an H.263 codec called Sorensen Spark. Flash Player 8 added support for On2 Truemotion VP6, which provides better quality, and Flash Player 9 includes support for H.264.

Facebook. Red5 doesn't currently support H.264 streaming, which could be considered something of a major drawback. However, the development team are working on that one and it looks as though H.264 support will be added very soon.

Adding a Flash video file

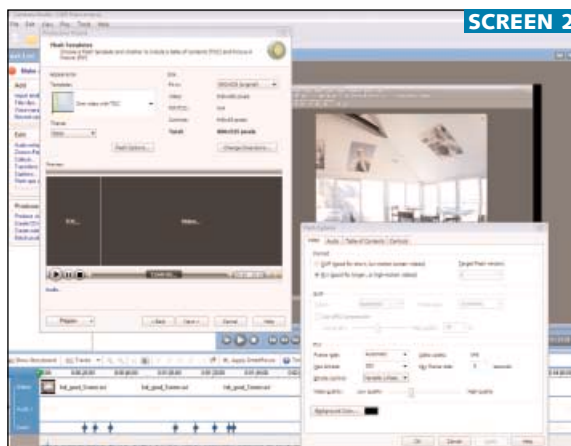
Using the latest version of Dreamweaver to add an .flv file to a web page is simple – one of the advantages of an all Adobe workflow. The Flash Video Component in Dreamweaver CS3 uses a wizard-based interface that provides delivery options (ie, progressive, or, if you have access to Flash Media Streaming Server,

streaming) and allows you to choose from a variety of skins and preview them. The wizard also gives you the option of adding code that detects the version of the viewer's Flash Player plug-in and prompts them to update it if necessary.

To add Flash video to your page, select Insert, Media, Flash Video and select the appropriate options in the dialogue box. Dreamweaver adds a code snippet to your page, which includes parameters that are passed to the swf player file using Flashvars. These include the width and height parameters and the skin filename, which is copied to the same folder as the HTML file. You can edit these directly; for example, if you want to use a custom skin. The script includes Adobe's AC_RunActiveContent.js script workaround that avoids a 'click to activate' message in older versions of Internet Explorer.

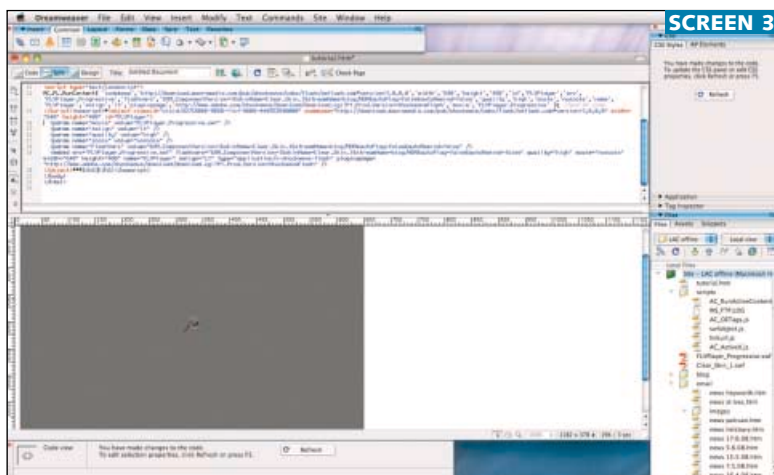
I was planning to move on to working with video in Flash, but we're running short of space. The advantages of doing it this way are that the video is just a component of the Flash movie, so you can design your own player, add interactivity, or write an entire application around it. There are some drawbacks, too. I'll go into those in more detail in a future column. **PCW**

Camtasia Studio provides excellent Flash video templates and encoding options



SCREEN 2

Adding Flash video to a web page in Dreamweaver



SCREEN 3



Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Word processing column.

Email wp@pcw.co.uk

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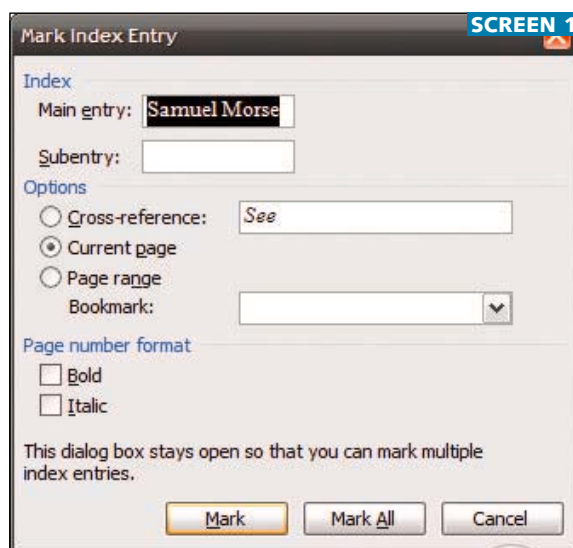
The saga continues

We wrap up a look at long documents with an index

Over the past three issues, we've been looking at the tools available in Word for creating long documents.

We're going to wind up this month with indexes – or indices for classical sticklers. Books have been written – and presumably indexed – about indexing, and for serious academic work it is considered a profession in its own right. The 1979 tome, *The Art of Indexing* by G Norman Knight, is still regarded as the definitive work on the subject for those content to work with index cards and shoeboxes. Fortunately, it's easier with word processors, but it still takes time and attention to detail.

In Word the basics are simple. Place the insertion point to the right of the word or phrase you want to index, then in Word 2003 and earlier Insert, Reference, Index and Tables, Mark Entry. Word 2007 users have a Mark Entry button on the References ribbon, and in any version Alt & Shift & X should bring up the Mark Entry dialogue. Type the text that you want to appear in the index in the Main Entry box. If you first select a word or phrase, rather than just placing the insertion point by it, then this text will appear in the 'Main Entry' box, but often this may not be what you want, and you'll need to edit it (see screen 1). If you've mentioned 'Samuel Morse' in the text, then you'd want him indexed under M as 'Morse, Samuel' rather than under S. You may also find using highlighted text introduces formatting inconsistencies when it comes to producing the index itself. The index entry text doesn't have to have any textual basis on the marked words. Having familiarised your reader with Samuel Morse, for example, you can start calling him 'Sparky Sam' and still refer those instances to the 'Morse, Samuel' entry.



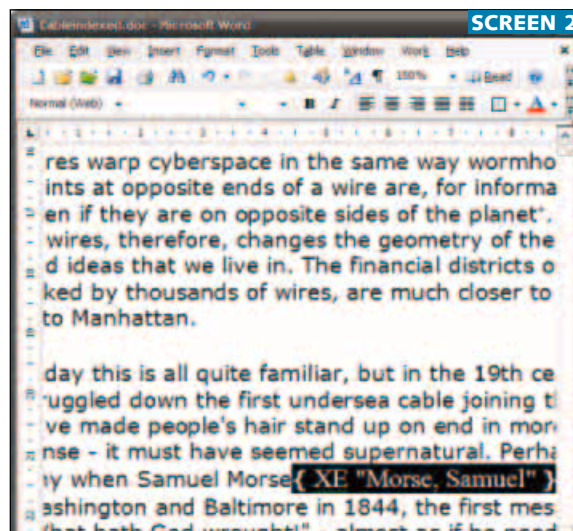
When you click the Mark button, this inserts a non-printing index entry (XE) field, and it makes sense to have these visible as you edit (see screen 2). Clicking on the paragraph marker button in the toolbar will make the marked entries visible. If you want to be more fastidious, then turn on Hidden Text from Tools, Options, View (2003 or earlier) or Word Options, Display in 2007. You'll also notice that the Mark Index Entry dialogue is non-modal – it stays open, so you can mark new entries without having to summon it each time.

When you click on the dialogue to create a new entry, the previous one disappears from the Main Entry box. The Mark All button does what it says – indexes every occurrence of the word or phrase in the document.

Select the text to be marked before you click on the dialogue, otherwise the Mark All button is greyed out. But you can edit this for the index entry itself and Mark All will still find all instances of the original selection. Mark All only puts the XE field by the first occurrence of the text in each paragraph.

Marking text for inclusion in the index

Showing index marks in the text

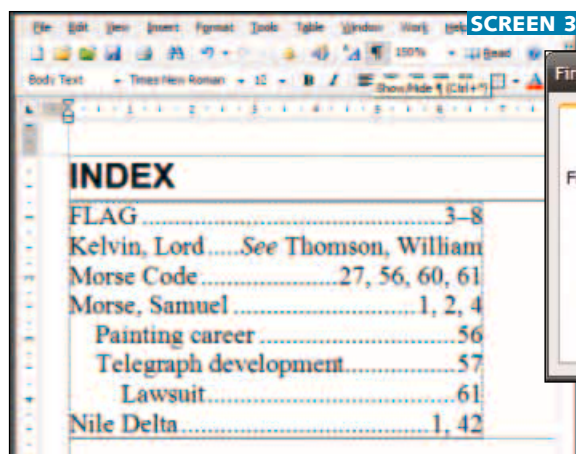


Creating the index

Having marked all the keywords to be indexed, it's time for the exciting part – creating the index itself. This is simple – go to the page where you want it to appear, summon the Index and Tables dialogue, and click the Index tab. The options here are straightforward, so we'll leave you to experiment, and all you have to do is click the OK button. As with a table of contents you can update an index by selecting it and pressing F9.

Let's take a closer look at that Mark Entry dialogue. You may want sublevels of index entries. For example, if Samuel Morse figures largely in your book, you may want to subdivide all the 'Morse, Samuel' entries into, 'Painting Career', 'Telegraph Development' and so on. You can do this by typing in the Subentry field in the Mark Index Entry dialogue. If you want further levels of subentry, separate these by a colon – 'Telegraph development:Lawsuit'.

The Options section lets you use cross-references. If your book contains references to the scientist William Thomson both before and after his ennobling as Lord Kelvin, then you can



An index showing bookmarked range, cross-reference and subentry

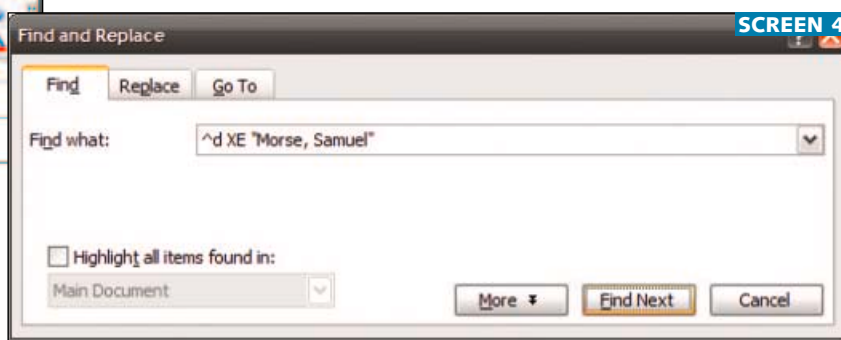
create an index entry for the latter that reads 'See Thomson, William'. You only have to do this for the first mention of Lord Kelvin, then you can mark an additional reference for this and all subsequent Kelvins, pointing from the 'Thomson, William' index entry.

Another option is to use a bookmark. If your book mentions the same indexed word or phrase over several consecutive pages, then it is not much help to the reader to have each one of these occurrences listed in the index. So, first you select the range of pages, then insert a bookmark. Next you mark an index entry using the third option – Page Range – pointing at the bookmark you've just created. This will produce the range, rather than a list, of pages when you update the index. Finally, you have a choice of how the page number will appear in the index – you may want to embolden or italicise references to picture captions, for instance.

We mentioned earlier that if you select text before opening or activating the Mark Index Entry dialogue, it will appear in the Main Entry box, but may have the wrong formatting. You can format this text just as you can with text on the page, but it can be fiddly, as the formatting of the highlighted text on the main page can also be affected. It's easier to leave it while marking index entries and tidy it up from the index itself. Select the index and all its contents – so it all turns black rather than grey – then apply a suitable style. With the index still selected, press Control & Spacebar to remove any character formatting (see screen 3).

Tips and troubleshooting

Consistency is all-important. If you use 'Morse, Samuel' and 'Morse, S.' as index entries, these will appear separately. The entries are also case-sensitive, so 'Morse Code' and 'Morse



Searching through XE fields

code' will again produce separate entries. You can jump between index marks with Go To, Field, XE – as with other 'Finds' you can keep this dialogue open. If you want to find all instances of a particular mark, then (for example) type

^d XE "Morse, Samuel"

in the Find box. Unfortunately, Word won't let you replace a field (^d) with a different field, but you can remove all instances of an XE field by replacing them with nothing (see screen 4).

The Automark button in the Index and Tables tab looks tempting, but to generate an automatic index you first need a table containing all the words or phrases you want indexing in one column and the index entries in another. This Automark file – also known as a Concordance file – probably takes longer to create than it does to mark the document manually, so we won't pursue this further.

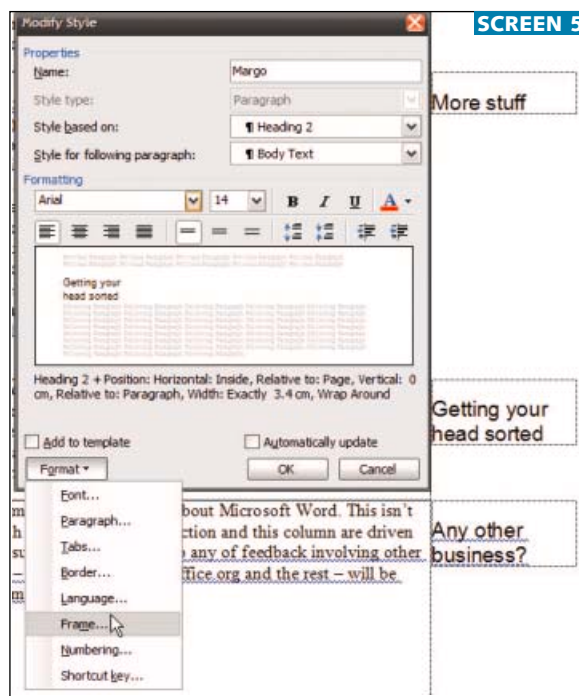
Framing in style

What goes around comes around, and you may remember that in December's Question Time we helped Alan O'Brien create Word text boxes in the inner or outer margins of facing pages. Alan wanted more. He had existing text in subheadings and wanted to move these into marginal text boxes as above. There were many and doing the job manually would have taken a long time. The problem is that text boxes and styles don't get along. You can assign a style to text within a box, and you can set text box defaults for a document in terms of border, fill placement etc. What you can't do is create a style that is already wrapped in a text box.

What Alan discovered, and was kind enough to share with us, is that you can do this with a frame. Frames went out of fashion with the advent of text boxes in Word 6. But frames can be formatted in much the same way and have the killer feature of being part of a style. So, let's say you have a number of headings formatted as Heading 2 and you want to move these into the inner margin. We are using Word 2003, but the principles are the same in other versions. Create a new style based on any style you like and give it a name. We've called ours Margo.

Click on the Format button and choose Frame (see screen 5). You'll be able to select the size – normally you would want something 'Exactly' a little less than the margin width, and auto height. Horizontal position is inside, relative to page, and vertical 0cm relative to (the next) paragraph. OK out; Add to template, OK again. Now right-click on Heading 2 in the Style pane, 'Select all nn instances', then click on Margo. Hey presto! All those subheadings are now in marginal frames. **PCW**

Creating a framed style





Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

→ Comments welcome on the Spreadsheets column.

Email spreadsheets@pcw.co.uk

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Make your first macro

Automating tasks in Excel is easier than you might think

When readers ask me how to do something in Excel they frequently precede the request with the phrase, "How do I create a macro that...". Invariably I reply that a macro is already built-in to do that job.

For instance, if you enter Jan in cell B1, point to the cross in the bottom right-hand corner of the cell and drag it to cell M1, the months Jan through Dec will appear along row 1.

If you enter ABC1 in a cell, point to the cross and drag the cell down the column the range will fill with ABC2, ABC3, and so on.

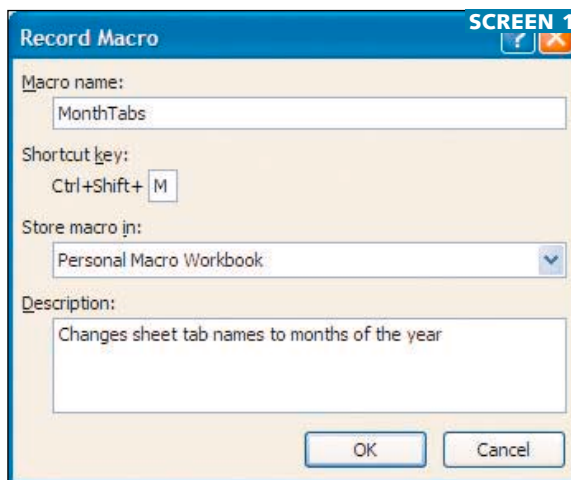
Such replies are all very educational about the features, functions and facilities provided in Excel but I wonder if I've been missing the point of the questions. People are fascinated by macros. It can be very satisfying to be the wizard who creates the magic of a series of actions happening by themselves.

There are two principal ways to make a macro. One is to record the keystrokes you make and have the code written automatically. That's only suitable for short macros. The other is to write the code yourself.

You could have a macro that changes the default worksheet names to the months of the year, adds enough sheets to complete the year if necessary, sorts them in chronological order, and puts any other worksheets at the end of the series. Let's use that as our example here.

The first decision is where to put the macro. If you put it in the workbook that will have its tab names changed then it's only available in that workbook, or if that workbook is open.

One solution is to put all your macros in a file created as a library of your macros. You could call the file



MyMacros.xls or MyMacros.xlsm with Excel 2007, but you would have to arrange for that file to always be open. Ideally you should be able to start Excel, open a new workbook, press a keyboard shortcut and the tab names change immediately.

Excel lets you do that with a Personal Macro Workbook. If you have one it will probably be in the path, C:\Documents and Settings\User\Application Data\Microsoft\Excel\XLSTART.

Unlike a MyMacros library file, it will remain hidden when you open Excel but its macros will be available.

If you don't have a Personal Macro Workbook, then it's easy to create one. In any version of Excel prior to Excel 2007, click on a worksheet. Under the Tools menu choose Macro, Record New Macro, pick Personal Macro Workbook, OK. Click the Stop button. You now have a Personal Macro Workbook.

With Excel 2007, click on the Office button and then the Excel Options button. Under Popular, Top Options, check the box against 'Show Developer Tab in the Ribbon'. Click on Record Macro under that new tab. In the displayed dialogue box, enter a

Put a macro in your Personal Macro Workbook

name for your macro like MonthTabs; a shortcut key like Ctrl & Shift & M; and a description of what the macro does like, "Changes sheet tab names to months of the year". Under, Store macro in: click the down arrow and choose 'Personal Macro Workbook' (see screen 1). Click OK and then the Stop Recording button.

Introducing VBA for Excel

Excel macros are usually written in a tailored variation of the language called Visual Basic for Applications, or VBA for Excel for short.

It has its own editor which can be opened by clicking on a worksheet and pressing Alt & F11.

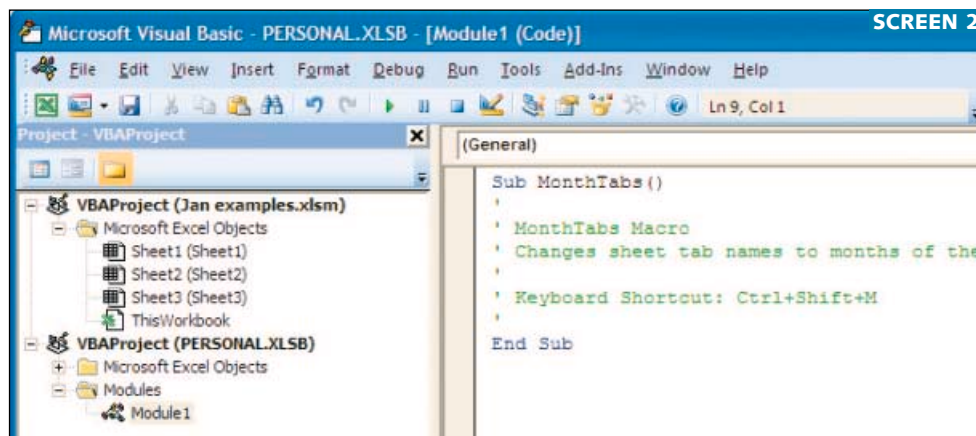
The name of your new Personal Workbook file will now be displayed in the panel on the left. In Excel 2007 it will be called, VBAProject (PERSONAL.XLSB). Open it to display Module 1 and the details you previously entered in the Record Macro dialogue box will be shown on the right. The top line will be "Sub MonthTabs()" and the bottom line

'If you don't have a Personal Macro Workbook, then it's easy to create one'

"End Sub". The details in between will be preceded by a single apostrophe and displayed in green. This indicates the words are just notes and not a part of the macro (see screen 2). You can delete these notes if you like without affecting the macro.

In any version of Excel you can always open the VBA editor, choose Module on the Insert menu and enter the listing for your macro in the right-hand panel.

A macro is either a subroutine which starts with Sub macro name ()



and finishes with EndSub or a custom function which begins with Function function name() and ends with End Function.

If a macro includes variables they will be of different types. By default they are called Variants but it is more efficient to classify or 'dimension' them at the start. An Integer variable only takes two bytes of memory.

A String variable only takes one byte per character. If you don't dimension your variables then both types will become Variant variables which take 16 bytes plus one byte for each character, if the variable holds a string. That consumes a lot more memory and can reduce performance.

This particular macro needs two Integer variables for sorting the worksheets and one String variable for the names of the months. So, if you have deleted the notes, after Sub MonthTabs() enter:

```
Dim x As Integer
Dim y As Integer
Dim mth(12) As String
```

Now you can enter the names of the months which are to appear on the tabs. Type:

```
mth(1) = "Jan"
```

```
mth(2) = "Feb"
```

and so on down to:

```
mth(12) = "Dec"
```

This macro assumes that you are running it on a new workbook with worksheet tabs called Sheet1, Sheet2, Sheet3, though the number of sheets in the workbook doesn't matter.

The next section of the macro uses a loop that says, if the first tab name starts with Sheets then change it to a month name, adding sheets if necessary. Enter:

```
For x = 1 To 12
If x <= Sheets.Count Then
If Left(Sheets(x).Name, 5) = "Sheet" Then
Sheets(x).Name = mth(x)
```

Choose your
Personal Macro
Workbook in VBA
for Excel

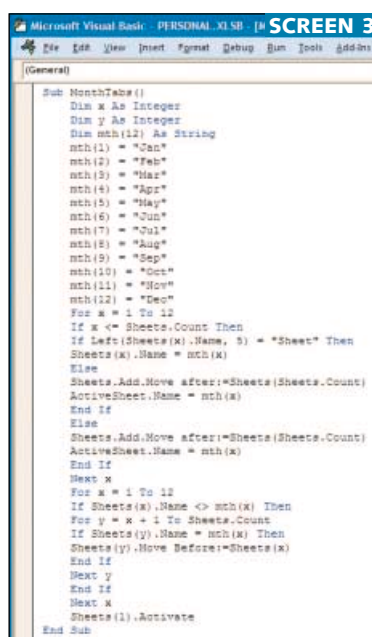
```
Else
Sheets.Add.Move <
after:=Sheets(Sheets.Count)
ActiveSheet.Name = mth(x)
End If
Else
Sheets.Add.Move <
after:=Sheets(Sheets.Count)
ActiveSheet.Name = mth(x)
End If
Next x
```

(Key: < code string continues)

All the macro has to do then is move any other sheets to the end of the series, so enter:

```
For x = 1 To 12
If Sheets(x).Name <> mth(x) <
Then
For y = x + 1 To Sheets.Count
If Sheets(y).Name = mth(x) <
Then
Sheets(y).Move <
Before:=Sheets(x)
End If
Next y
End If
```

Full listing of the
tab-labelling macro



Next x

Finally, we need to tell the macro to apply these instructions to the current workbook so enter:

Sheets(1).Activate

Then comes the closing line, End Sub, which is already written, and you're done (see screen 3). Save the Personal Workbook file. Open a new workbook, click on the first worksheet and run the macro using Ctrl & Shift & M.

Obtaining the code

No doubt I will receive requests for an easy-to-paste copy of this macro listing and I'm happy to comply. But one learns by doing and you will get more from this column if you enter the code line by line for yourself.

Readers running a macro in an Excel 2007 workbook for the first time are often apprehensive about the Security Warning they may receive.

But if it's your own workbook, and you have created the macro, then there is nothing to be concerned about.

If you save the workbook with an .xslm extension you won't get the warning. Office XML formats also use zip compression technology to store documents so they will be smaller files – always a good thing.

Although you may have deleted the notes displayed in green at the top of the macro code, if you entered the information in the Record Macro dialogue box it is still retained.

Click on a worksheet and press Alt & F8. The macro name appears, with the description and if you click the Options button in this dialogue box you'll see the keyboard shortcut. You can do this if at any time you forget the keyboard shortcuts for your macros.

In versions prior to Excel 2007, which don't offer a Record Macro dialogue box for entering a keyboard shortcut key and description before starting to record, this box, via Alt & F8, is available to let you do it after recording a macro.

Although this macro works whether the number of worksheets is less or more than 12, remember you can always change the number of worksheets that will appear in a new workbook.

In Excel 2007, click the Office button, Excel Options, Popular and choose the number you require under 'When creating new workbooks, Include this many sheets'.

In prior versions of Excel choose Options under the Tools tab, General, and Sheets in new workbook. **PCW**



Niall Magennis has been dabbling in Midi and digital audio since the days of the Atari ST. He writes for a number of music magazines and lives in London in a flat overrun with music equipment.

→ Comments welcome on the Sound column. It returns in the March issue. [Email sound@pcw.co.uk](mailto:sound@pcw.co.uk) Please do not send unsolicited file attachments.

Tagging your music

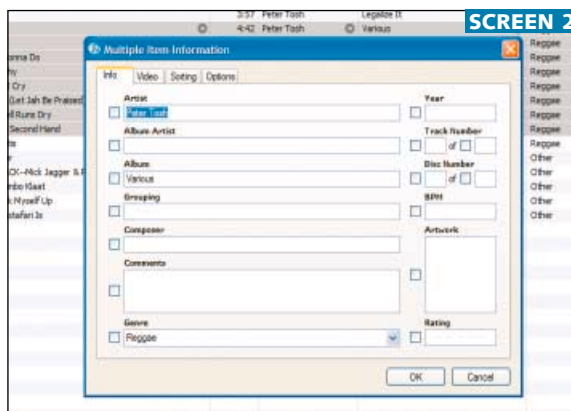
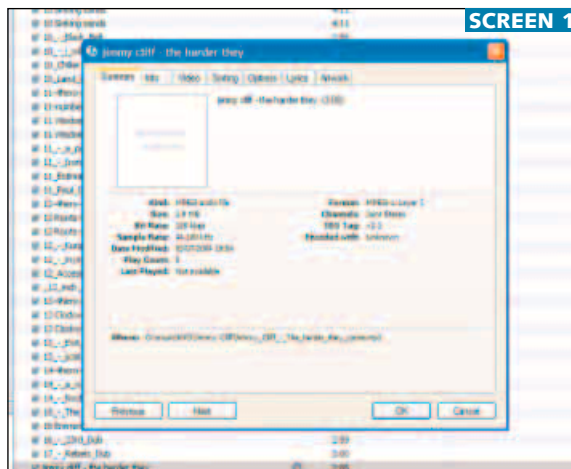
Adding the right tags is the key to managing your digital music collection

The shift towards digital music has brought us many benefits. Compressed music files mean we can fit hundreds of albums on our media players. However, one often overlooked advantage is that cataloguing music libraries is now much easier. All music players, such as Windows Media Player 11 and Apple's iTunes, allow you to browse albums by artists, album name or song title and you can create playlists comprising a variety of music styles and artists without having to shuffle CDs or cassettes. What's more, intelligent playlist creation technology, such as the Genius feature recently added to iTunes, allows you to pick a track and have a playlist automatically created for you based on its style and genre.

What makes all of this possible is some clever additional data called tags that are added on to your MP3 files when they're initially ripped from CD.

A history of id

When the MP3 format was first created it didn't include any support for tagging. MP3 was originally designed as a way of compressing audio for transmission alongside video on broadcast systems like digital satellite and cable TV. It wasn't until much later that people started to use MP3 as a way of compressing and storing music. However, by the mid 1990s it became obvious it would be useful if there was a way of adding text to MP3s to describe the content of the file. Eventually a system was developed that used a 128-byte tag at the end of the file to store artist, song and title information along with a small area for other comments. The tag went at the end of the file as a compromise to retain compatibility with existing software players. This tagging format became known as ID3 and was soon standard. Not long after



its introduction, however, it was tweaked to allow it to store track numbers, to indicate the play order of the tracks on the original source CD. This extended format became known as ID3v1.1.

However, ID3v1.1 tags weren't without their problems. The small amount of space available for storing data meant song and album titles longer than 30 characters had to be truncated; there was a set number of predefined genres that could be used; and because the tag was added to the end of the file, it was problematic when MP3s were being streamed over a network.

TOP: iTunes makes updating tags a pretty pain-free process

BOTTOM: You can edit the tags for multiple tracks at the same time in iTunes

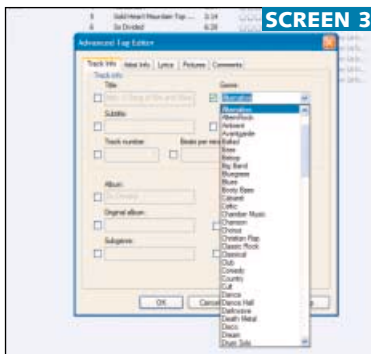
It was soon obvious that a newer, more flexible tagging system was needed and by 1988 a format called ID3v2 was introduced, but despite the name it bore almost no resemblance to its predecessors.

ID3v2 was a huge leap forward in terms of design and functionality. It is much more flexible because ID3v2 tags are made up of smaller pieces of information known as frames. Not all of these frames have a set role, so almost any type of data can be stored. It means ID3v2 tags can be used not just to add artist, album name and song title information, but also data such as album art, lyrics and web addresses. The system also includes an element of future proofing because new frame types can be added for extra functionality. Players that don't understand new frames will ignore them so compatibility is retained.

Whereas the older tagging formats suffered from a 128-byte limit, ID3v2 tags can be up to 256MB in size, with each frame having a maximum size of 16MB. Despite the extra storage space available, the tagging system is quite frugal in its storage needs, with the creators reckoning if an ID3v1 tag is converted to an ID3v2 it will take up less space. Another advantage of ID3v2 tags is that they are located at the start of a file, so when MP3s are being streamed the data is the first thing to be read. The ID3v2 format has been updated with a few tweaks over time with the current version at ID3v2.4.

Using tags

We can see the direct benefits of ID3v2 tags in the functionality of many of today's software MP3 players. For example, it allows music players to store how many times a track has been played so they can create lists of the most popular tracks in your library. Of course, if the tags on your MP3 files



Editing tags in WMP11 is a simple and straightforward process

are non-existent or incomplete then you won't be able to take advantage of the benefits that tagging brings. But while it's not uncommon to have MP3s in your collection that are poorly tagged, updating them is now easy. To edit a tag in iTunes highlight the track in the main library window and then right-click on it (or just hit Ctrl & I) (see screen 1). In the menu that appears select Get Info and then click on the Info tab. Here you can edit the usual information such as artist and song title, but you can also enter the track number or change the genre.

If you need to edit multiple tracks at the same time hold down the Shift key on your keyboard and highlight all the tracks in the album. You then right-click on these highlighted tracks and select Get Info. A warning box will appear asking whether you're sure you want to edit multiple tracks. Just click Yes and you'll be presented with an Info screen tailored for group editing (see screen 2) – it doesn't have a song title entry because it knows you're editing multiple tracks at the same time.

Windows Media Player 11 includes its own tag editing in a feature called Advanced Tag Editor (see screen 3). To use this right-click on a song in your library and select the Advanced Tag Editor from the pop-up list. The Tag Editor window will open on the Info tab where you can edit the artist, album and song title information as well as entering a track number and changing the genre if you want to. To save the changes to the track click on either the OK or Apply button. As with iTunes you can also edit multiple tracks at the same time. Hold down the Shift key, highlight the tracks you want to edit, right-click on them and open the Advanced Tag editor again.

WMP11 also lets you edit tag information directly in the main

Tagging other formats

As well as being supported by MP3 files, ID3v2 tags can also be used with the MP3Pro and MP4 formats, although their use with the latter isn't widely supported. Apple's AIFF also uses ID3 tagging and so is often a better choice than Wave for those who want to rip music to an uncompressed format. Currently there's no standard way of tagging Wave files. Of course, ID3 isn't the only tagging format in use today. Microsoft has its own format for use with ASF and WMA files, while FLAC and Vorbis use the Vorbis Comments system.



The open-source software Vorbis uses the Vorbis comments system for tagging audio files

You can use the Find Album Info feature to update all the tags for an album in one fell swoop

library window. Right-click on the attribute you want to change and select Edit from the pop-up menu. Type the new information directly into the attribute box. You also can edit multiple tracks at the same time by highlighting them using the Shift key.

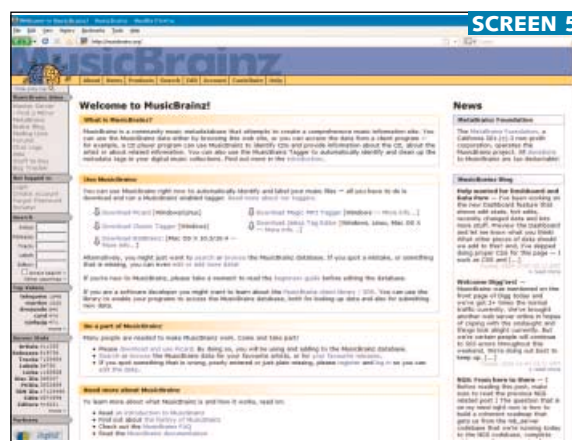
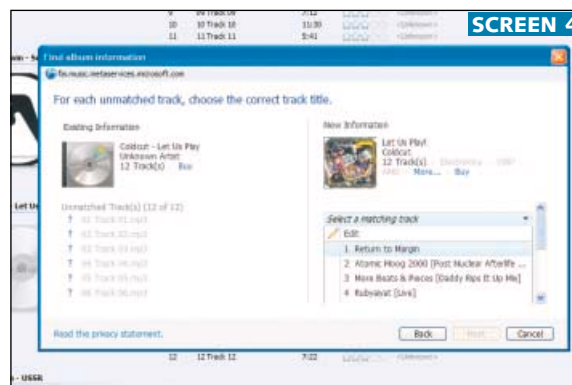
Updating tags

However, if loads of tags in your library are wrong, manually typing in lots of album and track titles can

become annoying. Thankfully, Microsoft has provided a quick way to update all of an album's information in one go. First find an album in your library that isn't tagged as it should be. Next either select all the tracks in the album manually or just right-click on the album art and then select Find Album Info (see screen 4). WMP11 will connect to the internet and scan its database to find albums that match the one you've selected. It will offer up a list of albums it thinks are relevant, with the best match highlighted at the top. If the album it has highlighted is correct, select it in the list and click Next. You'll be presented with a list of track titles which you'll need to match up with the unnamed tracks in your library. Once this is done, click Next and you'll be asked to confirm your selection. Click the Finish button and your MP3s will be updated with this new information.

There are plenty of other programs you can use to update the tags on your music files. Tag and Rename (www.softpointer.com/tr.htm) works with lots of different types of files and has a comprehensive list of features. Another option worth trying is Picard (see screen 5), which works with the Musicbrainz service and tries to automatically discover the right tags for your music. You can download it from <http://musicbrainz.org/>.

It might take a while to update the tags in large music libraries, but the benefits are many. Once your tracks are updated they'll start appearing in your randomised playlists and showing up in your library searches, allowing you to start enjoying those lost classics all over again. **PCW**



Picard works with the Musicbrainz system to try to automatically tag your files



Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.

Email networks@pcw.co.uk

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Email server for free

Take control of your email with a free mail server for your home network

In last month's Networks Hands On I mentioned that a new, free, version of the popular MDAemon email server had been released. So here's a look at what's involved in getting it up and running on a home network, concentrating on what it has to offer and what you don't get but might want.

Getting started

First you'll need to download the software, from www.zensoftware.co.uk, the website of the UK distributor. There's no separate download for the free version, you have to copy the full MDAemon install package (just under 48MB) and choose the option to install the free edition when asked.

It's not a huge application and an advantage of MDAemon compared with something like Exchange is that you don't need a server to host the Alt-N software. An ordinary desktop PC running anything from Windows 2000 onwards is fine, although for my tests I thought it would be interesting to use Windows Home Server (WHS). That's primarily because an email server is one thing WHS lacks and, because WHS is based on Windows Server 2003, MDAemon Free should, in theory at least, be a good fit.

Installation is easy. Run the downloaded executable and you're asked for your email domain name (see screen 1) – the bit after the @ symbol. If you're setting up a local server this can be anything you like – I used "myhome.local". However, if you want to be able to send and receive messages over the internet you'll need a registered domain. If you haven't got one, contact your ISP or one of the many service providers willing to register and host one for you.

You're then asked for a name and password to assign to the mail administrator, also referred to as the



Postmaster, followed by the DNS settings to use. I opted for the Windows DNS defaults. I also took the default option to run the mail server as a background service, with MDAemon started automatically every time the host computer is booted.

Addressing issues

Initial setup took just a few minutes. However, some additional work was needed before the mail server could send and receive messages.

In the paid-for versions of MDAemon, for example, there's a tool called DomainPOP which can be configured to pull down messages from hosted Pop3 mailboxes. Most of us have hosted Pop3 mail accounts, so use DomainPOP and hardly any changes are needed when you switch to MDAemon, which is great. Except that it's not available with the free

On a Lan the MDAemon server can be configured with any domain name, but external communications require a public domain

Email clients such as Outlook need to be configured to send and receive messages via the MDAemon server

edition. The only option is for the MDAemon SMTP mail server to sit and listen out for incoming messages which, instead of being pulled down on demand, are "pushed" out by other mail servers and clients.

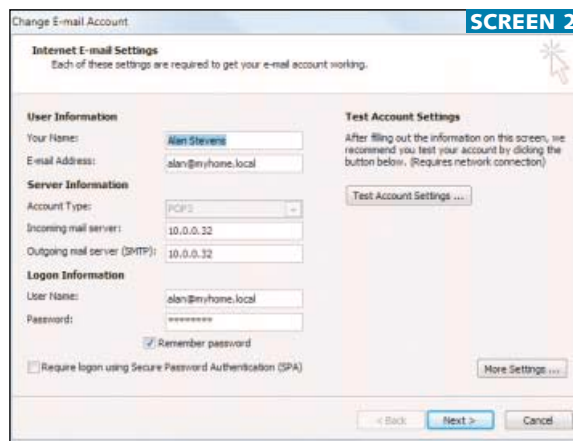
That's fine if those messages are being sent between local users over a Lan. All you have to do is configure Outlook (or your mail client) to send and receive mail, by specifying the name or IP address of the local MDAemon host, as in screen 2.

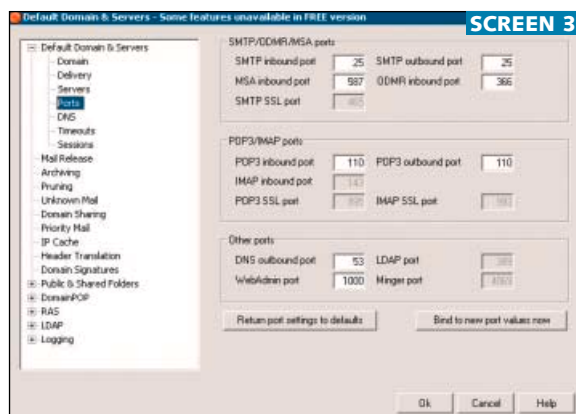
External clients and mail servers, however, can't be configured with your mail server name/address and will only have your domain name to go by. To get around that the DNS settings for your domain need to be configured to direct SMTP mail senders to a publicly accessible IP address that will, in turn, connect to your MDAemon server.

The DNS settings involved here are referred to as Mail Exchange (MX) records and a lot of service providers will configure them as a matter of course when an account is first set up. However, not all do so, especially on home broadband services, so you'll need to check and get them set up if they're not. Alternatively, if your domain is hosted by a provider who lets you manage DNS yourself, you can make the changes directly.

The type of address you have is also important. Ideally, it'll be fixed (most ISPs offer this), otherwise you'll need to use a dynamic DNS service, such as DynDNS (www.dyndns.com) that keeps your DNS settings updated to match the address you were assigned when connection to your ISP was made.

You'll also need to make some changes on your router to allow SMTP traffic through. And if, like many home users, you're using Network Address Translation (NAT) to share a single public IP address, you'll need to





direct that traffic to the right machine.

Exactly what's required here will depend on the router involved but you, typically, have two choices. One will be to make the whole mail server accessible via the public IP address (not recommended) or to only forward SMTP traffic (usually received on port 25) to the local email server.

Note where I say SMTP traffic is "usually received on port 25". Unfortunately some ISPs block that port to prevent their networks being used to relay spam, as with my provider O2 Broadband. Opt for a fixed address and this limitation may be lifted (it is with O2), otherwise you should find that you can configure your mail server to use a different port to handle SMTP (see screen 3).

Some changes to the firewall on the MDAemon host may also be needed to, again, let SMTP traffic through and allow Pop3 client access. I also had to configure an exception to allow HTTP traffic through on port 1000 before I could use a browser to remotely manage the MDAemon server using the optional Webadmin tool. I also had to set up another exception for HTTP, this time on port 3000, before the web-based mail client (Worldclient) would work.

What you get, what you don't

Having done all that, configured some user accounts and set up my client PCs to access the MDAemon server, it all worked as expected. At least it did in that I was able to send and receive messages locally via the server, and do the same over the internet. But that's about all you get and, to be honest, I was a bit disappointed by MDAemon Free, especially compared to the paid-for Pro version (£208.79 ex Vat for six users), which is awash with features.

The fact you're limited to just five user accounts in the free edition won't affect a lot of home networks, but a

If your ISP blocks port 25, the MDAemon server can be configured to use a different port for SMTP traffic

Remote console access

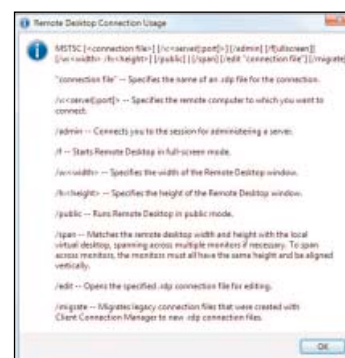
I want to share a problem I encountered when using Remote Desktop to manage MDAemon Free on my Windows Home Server. Simply put, like a lot of server software, the MDAemon service and management tools are installed to run in the permanent Windows console session (session 0), but when you connect using Remote Desktop, the host terminal server starts a new temporary session which doesn't have access to code running in session 0.

To get around this, early implementations of remote desktop let you specify a "/console" switch when starting the client (mstsc /console). However, that's a potential security risk so the option has been removed in the latest implementation as found both in Vista and in Windows XP if you've installed SP3.

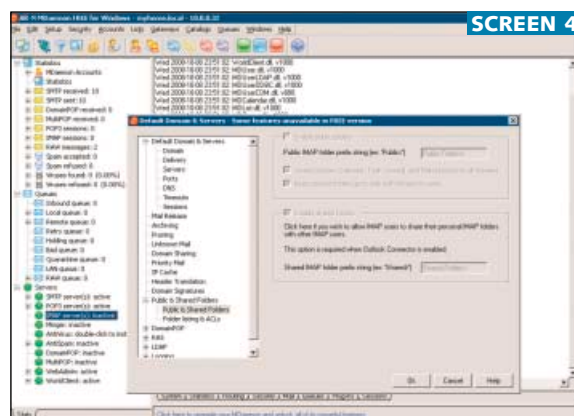
In order to connect to the console on a WHS or Windows Server 2003 system like I did, two

workarounds are available. One is to use a new "/admin" switch instead (mstsc /admin), which does much the same as the old "/console" switch. The other is to connect to a standard user session then run the client again, specifying the "/console" switch, in that session.

Alternatively you can use a free remote control applications like VNC (www.realvnc.com) instead.



To remotely manage the console on my WHS server I started the remote desktop client with the "/admin" switch



A lot of the more useful options have been disabled in the free edition of MDAemon

number of useful options have been left out (see screen 4). There's no support for Imap access, for example, which means you can't store your messages on the MDAemon server and access them from more than one client PC. The only option using a client like Outlook is to pull messages down using the Pop3 protocol. That means they're only accessible on that PC which somewhat defeats the reason for installing a mail server.

On a positive note, you can leave messages on the server and access them with a browser, via MDAemon's built-in Worldclient software. However, in the free edition you only

get the standard Worldclient, not the Outlook-like clone known as Lookout. And it's HTTP access only, with support for SSL encrypted connectivity also disabled in the free edition.

There's no support either for the MDAemon Outlook plug-in or any of the Exchange-like groupware and information sharing facilities available in the full MDAemon package. Anti-spam filtering is disabled too, even if you pay for the Security Plus add-in (£68.68 ex Vat for six users), which when used with MDAemon Free only adds basic anti-virus protection.

Other server options

The bottom line is that, although a solid product, MDAemon Free is really only a basic SMTP mail server and may not meet the requirements of many home users. Upgrade to the paid-for Pro version and you get support for the Imap protocol and information sharing facilities. However, for home users it's not cheap. Alternatives with Imap support are available for less, and there are some free products such as Hmailserver (www.hmailserver.com) which I'll look at in a future edition. Or you can use a hosted email service, but that's another story altogether. **PCW**



Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ Comments welcome on the Databases column.

Email database@pcw.co.uk

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Database or spreadsheet?

Find out the best way to organise your information

The question, 'Should I be using spreadsheet or database software?' comes up intermittently. Both tools are useful and adaptable, and I'm a fan of both, using a spreadsheet on at least a weekly basis, despite being a self-confessed database geek. Each has its own data handling strengths and these will determine which is best for the task in hand.

If you want to manipulate single values, such as subtracting value A from value B and recording the result as value C, a spreadsheet is ideal. It's even more so if you're working with columns of values and want, say, to subtract each value in column D from the value in column E on the row above, recording the results in column F. This is perfect spreadsheet country, as my esteemed colleague Stephen Wells would, I am sure, attest.

Spreadsheets are also great for collecting data: a worksheet is easily equated with a sheet of squared paper,

SCREEN 1

ID	ObsDate	ObsTime	Blackbird	Robin	Blue tit	Great tit	Greenfinch	Chaffinch	Dunnock	Coal tit	Brambling	Siskin	Goldfinch
1	04/07/1983	08:00	1	1			3			1			
2	04/07/1983	11:00			2	1							
3	04/07/1983	13:00	1	1	1		4			1			
4	04/07/1983	16:00			2				2				
5	04/07/1983	18:00	1										
6	05/07/1983	08:00		1	2	3			1				5
7	05/07/1983	11:15			1		3			2	1		
8	05/07/1983	13:00			1		2						
9	05/07/1983	16:00		1					2		1		
10	05/07/1983	18:00	1				1						
11	06/07/1983	08:00		1			4		1				
12	06/07/1983	11:00			2	3							
13	06/07/1983	13:00				1			2	1			
14	06/07/1983	16:00	1		2		2		1	1			
15	06/07/1983	18:10		1									

I'm not saying it is impossible to perform what are effectively set operations with a spreadsheet, just that it is likely to take considerable expertise to bend it to your will and it may well, in the end, be more efficient to use a database. The decision depends not only on what you want to do but on your level of expertise with the tools. If you're a spreadsheet whiz like Stephen, you may decide to stick with the program (sorry), but if you have some knowledge of both, or if

The original bird-watching data collection structure contains sparse data

in terms of creating a database, designing ways to view the data and concocting queries to find specific data. This focus can hide the fact that the same tools can be used to take data from an unstructured source and transfer it into tables in a rigorously defined relational database.

The decision to move data to a database can also be triggered by a desire to analyse data and a need to perform a wide range of operations to ascertain trends and variations between sets of records. That's the position Stan Moore was in when he contacted me.

A bird in the hand

Stan watches birds in his garden. A keen observer, he's been recording avian activity for 14 years, noting several times a day the bird life visiting his feeding station. Now he wants to move it to a database (Access) and analyse it. Stan has worked out a

'If you want to manipulate single values, such as subtracting value A from B and recording the result as C, a spreadsheet is ideal'

letting the newest user record data in an organised way in easily readable columns and rows. What's much harder with a spreadsheet is to find a set of values and perform an operation on each of them, but this kind of operation is meat and drink for an RDBMS (Relational Database Management System). An RDBMS is built to perform set operations; that is, it takes a set of data and performs an operation on each of them – no ifs, no buts, each gets the same treatment. For instance, it can find all products from supplier X and add five per cent to the price of each.

you actively want to learn about databases, you could benefit from using an RDBMS.

An RDBMS' role in life is data handling and we usually think of this

Final table structure: one species observation recorded is in each row

SCREEN 2

ObsDate	ObsTime	Species	NoObserved
04/07/1983	08:00	Blackbird	1
04/07/1983	08:00	Dunnock	1
04/07/1983	08:00	Greenfinch	3
04/07/1983	08:00	Robin	1

sound table structure to hold the data, which is presently residing in Excel. His question is whether he should rearrange the data in Excel before importing it into Access. He'll need to identify sets of data within his spreadsheet and manipulate them, so my answer is to import the data as it is and then manipulate it within Access.

A small subset of the data, imported into Access by clicking Excel on the External Data tab and working through the dialogs, looks like Screen 1.

Incidentally, this table exhibits the same characteristics as one of those discussed in November's column: despite appearing to contain repeating columns, the table is in first normal form. This does not guarantee that it's an ideal table structure, however. It's very sparsely populated with data and that will usually have the effect of slowing down querying. For Stan's analysis that's bad news, but he's on top of the situation, having designed a table in Access that looks like Screen 2.

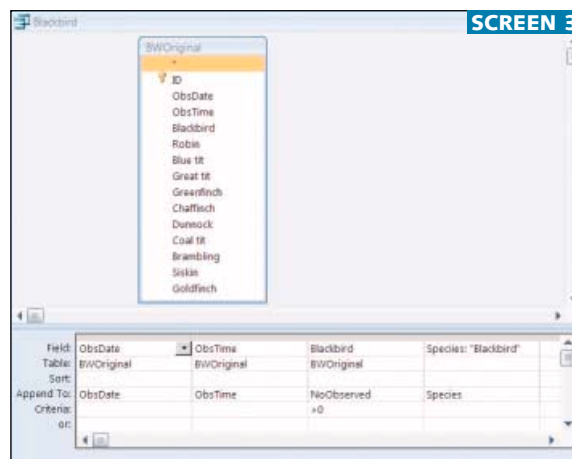
The observation of each species has been separated out from the original format, which will result in a table with far more rows, but one that will be faster and easier to query. So our task is to extract the data for the new type of row from the original table and insert it into a table of the new structure.

Primary suspects

The first step is to create a table of the new structure with columns for ObsDate, ObsTime, Species and the number of individual birds observed – NoObserved in the sample database (DBCJan09.mdb on the cover disc).

What about a primary key column? In the original data one ID covers observations of multiple species, and in the new table each 'species observation event' gets its own row, which means we cannot simply copy IDs from the original to the new table. Doing so would create multiple instances of IDs in the new table, rendering it useless as a unique identifier. Happily, the data contains the makings of a natural primary key: this term describes a column or columns inherent in the data collected that can be used to guarantee uniqueness. The alternative is to add a column, often an AutoNumber ID (and, sadly, not called an 'unnatural PK').

The natural primary key for the new table comprises three columns – ObsDate, ObsTime and Species. It



Query grid for the Append query that will move data from the original table to the new one

uniquely identifies each species observation event. With this key in place it is impossible to add an observation that duplicates the time of observation and the species observed. A simpler but not so foolproof answer would be to add an AutoNumber ID column and use this as the PK field.

To populate the new table – BWNew – we'll use an Append query to move the data we want from the original table (BWOriginal) to the new

and on the Append To: line type:

Species

This will write the string 'Blackbird' into the Species column for each record where more than zero blackbirds were seen. The SQL, shown in Screen 3, is:

```
WHERE Blackbird>0;
BWNew ( ObsDate, < ObsTime,
NoObserved, Species )
SELECT ObsDate, ObsTime, <
Blackbird, "Blackbird" AS <
Species
FROM BWOriginal
```

```
WHERE Blackbird>0;
```

(Key: < code string continues)

Use the View button to see the result and double-check by referring to the original table. If it looks good, click Run to perform the append. Proceed through the list of birds, editing the query each time. The result will be a table of 44 uniquely identifiable species observations cheeping plaintively to be analysed.

Sorting sorted

Tim Lloyd has a problem with data being sorted into an unusual order in his Access 2003 table: he's using a

'The first step is to create a table of the new structure with columns for ObsDate, ObsTime, Species and the number of birds observed'

format. Base the Append query on the BWOriginal table and include the date and time columns, and one of the bird name columns. We want to find all the instances where, say, a blackbird was spotted, so on the Criteria: line for the Blackbird column write:

>0

If the number of blackbirds exceeds zero, we want to see the fact in the new table. The information about which species was spotted was held only in the column heading in the original table, so we need a way of recording that data in the new table. In a new column, add an expression like this:

Species: "Blackbird"

Point	Height
D	-1.00
E	-2.00
B	4.50
C	2.00
A	1.00
*	0.00

The descending sort of mixed negative and positive decimal values doesn't sort

Number field with a Decimal field size and his values include negative numbers. Sorting the values into ascending order works fine, but odd results appear when they're sorted into descending order, such as the example in Screen 4.

It is, in fact, a known bug in Access 2000, 2002 and 2003, and there's an article in Microsoft's knowledge base about it (article ID 837148).

The workaround is quite straightforward: open the table in Design view and set the Indexed property for the offending column to 'Yes (Duplicates OK)'. Save the table and try the sort again. This time it works as it should.

In 2007 the problem has been fixed and sorting works as it should in either direction. Not that having to wait seven years for a cure is a huge cause for celebration. PCW

End note

Mark Whitehorn has written this column for the past 15 years. The best bits are available in a book: visit www.penguinsoft.co.uk for details.



Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the internet.

→ Comments welcome on the Visual programming column.
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Hack attack

Prevent a common web hack by using MySQL Improved

SQL injection is a common reason why websites get hacked. It is a simple hack, but thousands of applications are vulnerable, especially older applications made when the web was a little less dangerous. Old-style ASP (as opposed to ASP.NET) and PHP applications are particularly vulnerable. The key factor is how user input is handled.

Most web applications interact with a database. A classic pattern includes a login form, which queries the database to check the username and password combination, followed after authentication by other forms that read and write data. The problem is how to handle deliberately malformed data entered by the user.

Here is an example. Imagine you have a login form that calls another page called welcome.php. The welcome page opens a MySQL connection and then has code such as this:

```
$username = $_POST[username];
$password = $_POST[password];
```

```
$query = sprintf("SELECT *
from users WHERE username='%s' AND passhash =
password('%s')", $username,
$password);
```

```
//print the query for debugging
print("The query is:
".$query);
```

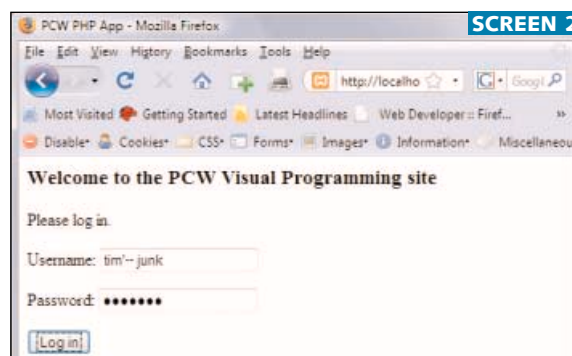
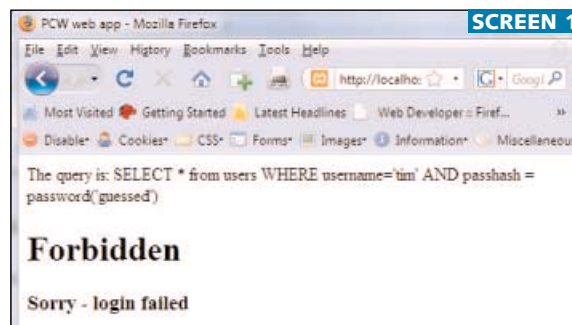
```
$result = mysql_query($query);

if (mysql_fetch_row($result))
{
    $loggedin = true;
}
```

(Key: \ code string continues)

In this code, the passhash field stores a hash based on the password, saved using MySQL's Password() function.

Now imagine some hacker knows my username, which is not secret,



but not my password, which is, and tries to log in. The result is shown in screen 1 – login fails.

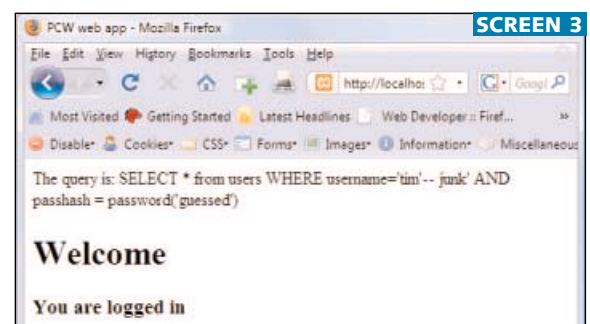
The hacker knows that in SQL, a double hyphen means that the rest of the statement is a comment and gets ignored. He therefore enters a strange username, such as 'tim-- junk', followed by the same wrong password, as in screen 2. Now the login succeeds (see screen 3), because the password is no longer checked.

This particular hack will not work with every application. A common PHP solution is to replace quotes in user-entered data; in fact, you can do this automatically by setting: `magic_quotes_gpc = On` in php.ini. You can see the effect in screen 4. The username becomes 'tim\'-- junk', making the stray quote harmless because it is escaped.

Logged in, even with the wrong password

Top: Right username but wrong password means login fails

Bottom: Entering a strange username can bypass the security



Unfortunately, there are problems with the magic_quotes setting. The most obvious is that unless you control all the servers on which the application runs, you cannot guarantee it is enabled. You can test for it with the `get_magic_quotes_gpc()` function and take other steps if it is disabled. But in that case, why not just take the other steps? Second, it is not a perfect solution but more like a workaround, which may not defeat all attacks. Third, magic quotes are deprecated and have been removed from PHP 6.

Set parameters

Microsoft's ASP.NET is less vulnerable to SQL injection because the normal coding style is to use SQL parameters. SQL statements are not created by concatenating SQL commands and user-entered values. Instead, the SQL statement has placeholders, which are assigned values later. This means the database engine can clearly distinguish between what is SQL and what is data, making SQL injection impossible.

If you can do this in ASP.NET, why not in PHP with MySQL as well? You can do exactly that by using the MySQL Improved Extension, available in MySQL 4.1 and higher. Instead of using the PHP functions prefixed `mysql_`, you use another set prefixed `mysqli_`, provided your version of PHP is compiled with `mysqli` support.

Recession – a boon for open source

Should you choose a commercial or an open-source platform for your next programming project? Speaking at the Future of Web Applications (FOWA) conference in London, at the end of a week in which the stock market fell by 20 per cent, Sun's Tim Bray, well-known co-inventor of XML, said that recession will boost open-source technology. "Open-source software is going to get a huge shot in the arm," he said. "Any project that requires an Oracle licence, or any kind of Enterprise licence, is just not going to get past the approval process."

He added that tough economic times will accelerate the trend towards cloud computing – running applications from the web rather than from local servers. "The business benefits of going into the cloud, where you only have to pay a little at the beginning, and you don't pay anything serious until you see benefits, are going to look overwhelming."

Bray is director of Web Technologies at Sun, and his company is already an open-source advocate, so his predictions are in line with what you would expect him to say anyway.

Further, companies under financial stress are more likely to freeze IT projects than to change their platform, and licences are often only a small proportion of overall costs.

Nevertheless, free software has an obvious attraction when there is pressure to cut costs. There is another hidden benefit, which is that



Tim Bray, co-inventor of XML, says recession will boost open source

the online community around software such as PHP and MySQL is so huge that help and sample code are particularly easy to find.

Bray's most telling point was about blinkered developers who only have time for one platform. "Stop believing in programming religions," he said.

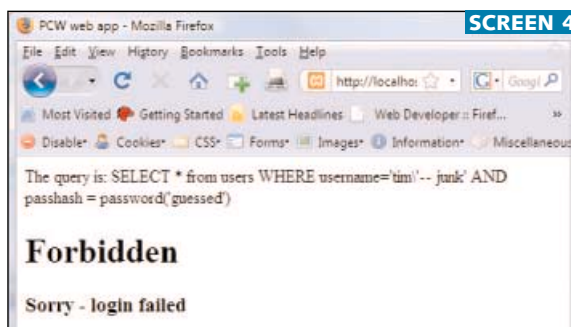
That point was reinforced by two other speakers at FOWA – Ruby developer Blaine Cook, formerly of Twitter, and PHP developer Joe Stump, who is lead architect at Digg. In a dual session, they argued that the bottlenecks in web applications are rarely anything to do with the language used. Application design and the speed of data transfer to the disks and over the network are more important. It pays to be flexible about programming choices, particularly in a downturn.

There are two approaches, object-oriented or procedural. The procedural approach looks like this:

```
$conn = mysqli_connect(
($host,$mysqluser,
$password) or
die ("Could not connect to
the database");
mysqli_select_db(
$conn,$dbname);
$stmt = mysqli_prepare(
$conn,"SELECT ID,CompanyName
from users where username = ?
and passhash = password(?)");
mysqli_stmt_bind_param(
($stmt, "ss", $username,
$password);
mysqli_stmt_execute($stmt);
//execute the query
mysqli_stmt_bind_result(
($stmt, $ID,$CompanyName);
//bind result variables
if (mysqli_stmt_fetch(
($stmt)) {
// values read and we are
logged in
$loggedin = true;
}
mysqli_stmt_close($stmt);
mysqli_close($conn);
```

Alternatively, you can use the mysqli classes:

```
$mysqli = mysqli_init();
$mysqli->real_connect(
($host,$mysqluser,$mysql
password,$dbname);
$stmt = $mysqli->prepare(
```



Magic quotes
defeat the SQL hack

```
("SELECT ID,CompanyName from
users where username = ? and
passhash = password(?)");
$stmt->bind_param(
('ss',$username,$password);
$stmt->execute();
$stmt->bind_result(
($ID,$CompanyName);
if ($stmt->fetch()) {
//we are logged in
$loggedin = true;
}
$stmt->close();
$mysqli->close();
```

Both versions of the code follow the same sequence. After making a connection, you create a prepared SQL statement, which means a statement that sits on the server ready to be executed, with variables that enable you to modify the values used. These variables are included in the statement as "?" characters.

The next step is to assign values to the parameters using bind_param. The

first argument to bind_param lists the type of the variables in order, according to the following key:
i integer
d double
s string
b blob

Next come the actual values, separated by commas. The number of types and values has to match the number of parameters in the actual statement.

Run the statement

After bind_param, the call to execute() runs the statement, and if it returns a result set, bind_result sets up PHP variables to contain the returned data. Following bind_param, each call to fetch() populates these variables with the next row. The fetch() function or method returns true for success, false for error, or null if no more rows exist. For details on how to use mysqli, see the online documentation.

Should you use the procedural or the object-oriented approach? This is largely a matter of taste, though the object-oriented code is cleaner and easier to maintain. Going back to SQL injection, what really counts is that the code on your site is not vulnerable. Using mysqli with prepared statements is one way to improve security. **PCW**

MySQL reference
<http://php.net/mysqli>

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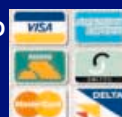
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As you know at PCW Direct we are always trying to bring you the best deals we can. You will find Ninja Brain Workout retailing at £19.99 but we can offer you it for only £14.99 - giving you a 25% discount on the RRP.

As reviewed in our sister publication **Computeractive**

Ninja Brain Workout is a brilliant effort and, for jigsaw addicts it's probably worth the money for Jigsaw Mania alone.

As reviewed in Computeractive - issue 245

Overall *****

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(CODE PC10)

COMPETITION

WIN! A Humax Foxsat-HDR Freesat PVR



The new Foxsat-HDR from Humax is the latest option for the digital switchover (DSO), which started in November 2008 and will see everyone in the UK switching from analogue to digital TV by 2012. We've teamed up with Turbosat to give PCW readers the chance to experience the ultimate in satellite TV reception.

The first Freesat+ recorder in the UK – the Foxsat-HDR – allows you to watch and record TV on the free satellite service launched earlier this year by the BBC and ITV. Freesat gives you access to all the terrestrial channels, plus plenty of new digital stations, including extra news and entertainment channels, and digital radio services, all without a subscription.

With the Foxsat-HDR, you can pause and rewind live television, schedule recordings on the built-in 320GB hard disk and even record a whole series at the touch of a button. With around 200 hours of space on the hard drive, you'll always have something to watch, and the straightforward electronic programme guide makes it easy to browse through the channels and see what's on.

As well as standard-definition (SD) programming, the Foxsat-HDR lets you watch and record in high definition (HD), so you can capture your favourite shows – such as *Heroes* on BBC HD, or *Sharpe* on ITV HD – without having to pay a subscription. When you choose to record a show, you'll even be asked if you'd prefer to record the HD version, if it's available.

The Foxsat-HDR allows you to record both SD and HD satellite broadcasts, without needing to purchase a subscription

With twin tuners, you'll be able to record two different channels at the same time, so there's no excuse for missing anything again.

Packed with advanced features, the Foxsat-HDR allows you to transfer recordings to a USB memory key or external hard drive, and the Ethernet port allows for future expansion, with the BBC's iPlayer expected on Freesat in 2009.

This month's second prize is an Icecrypt T5000 Freeview box, which will give you access to all the Freeview channels through your TV aerial, providing channels such as BBC4, BBC News, ITV 2, Dave, Virgin 1, More 4 and Film4 – all without a subscription.

The T5000 is a low-power receiver, certified by the Energy Saving Trust, so you can watch digital TV with a clear conscience.

For your chance to win the Foxsat HDR, answer the question below and enter online at www.pcw.co.uk/competitions. The competition opens on 27 November 2008 and closes on 24 December 2008.

What does DSO stand for?

- a) Digital Services Online
- b) Digital Switchover
- c) Digital Secondary Offering

TURBOSAT



The Icecrypt T5000 is a low-power Freeview receiver, tested by the Energy Saving Trust

To receive Freesat you will need a suitable satellite dish installation; to receive Freeview you will need a suitable TV aerial installation and Freeview coverage. Prizes consist of a receiver only, and do not include dish, aerial or installation. This competition is open to readers of PCW, except for employees (and their families) of Incisive Media, and Turbosat. PCW is the sole judge of the competition and the Editor's choice is final. Offer applies to residents of the UK and the Irish Republic only. Entrants must be over the age of 18 and only one entry per household will be accepted. Winners will be selected at random from all correct entries received. No cash alternative is available in lieu of prizes. Incisive Media will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. Incisive Media reserves the right to substitute the prize for one of greater or equal value if circumstances make this unavoidable. Prizes will be dispatched by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. Incisive Media will use all reasonable efforts to ensure that the prizes are as described on this page. However, Incisive Media cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

The winners of the November competition are Leslie Pounder and Roy Pottinger, both of whom won a Medion Akoya S5610 laptop worth £600.

ENTER ONLINE AT www.pcw.co.uk/competitions

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Tel 020 7316 9000 Fax 020 7316 9313 www.pcw.co.uk

Editor: Kelvin Taylor

Associate Editor (News): Clive Akass

Labs Project Manager: Simon Crisp

Stores Supervisor: Alan Rider

Group Support Assistant: Karen Raj

Contributing Editor: Nigel Whitfield

Editorial contributors: Tim Anderson, Barry Fox, Dinah Greek, Cliff Joseph, Guy Kewney, Gordon Laing, Paul Lester, Niall Magennis, Ken McMahon, Paul Monckton, Tim Nott, Tom Royal, Barry Shilliday, Alan Stevens, Tim Smith, Will Stapley, Jon Thompson, Andrea-Marie Vassou, Stephen Wells, Mark Whitehorn

ART & PRODUCTION

Art Editor: Jonathan Ross

Group Production Editor: Debbie Oliver

Production Editor: Lindsay Parish-Jones

Senior Sub-Editor: Harry Burrows

Sub-Editor: Matt Andrews

Art & Production Contributors: Peter Kernan, Donatella

Montrone, Susie Norris, Eva Peaty

Photography: Bruce Mackie

Cover illustration: Alex Slobodkin

PUBLISHING

Group Publisher: Dylan Armbrust

Managing Director Professional Services: Graham Harman

Deputy Managing Director: Kumaran Ramanathan
Founder: Angelo Zgorelec

MARKETING & CIRCULATION

Marketing Manager: Louise Newland

Circulation Manager: Emma Smyth

Marketing Executive: Rahila Ehsan

Circulation Marketing Executive: Samantha Nasser

New Media Manager (CD/DVD): Chris Wiles

ADVERTISING

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Client Manager: Maria Theodorides-Andreou 020 7316 9223

Classified Sales: Maria Theodorides-Andreou 020 7316 9223

Sales Executives: Clare Benson 020 7316 9118,

Richard Mann 020 7316 9208

Sales Consultant: Stephanie Quist 020 7316 9723

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Taiwan Sales Representatives: Transactionmedia Ltd, 11th Floor No 1 Sec. 2 Dunhua S. Rd. Taipei 106 ROC Taiwan 00 886 2 8772 5145. Contacts: Nitin Joshi, Lilly Mao

CENTRAL PRODUCTION

Senior Production Manager: Cathy Mahoney

Digital Production Controller: Rebecca Yeglis

Production Controller: Scott Day

To email any PCW staff member, use the following:
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- 3 Keep good records, storing receipts, correspondence in one place.
- 4 In England and Wales, the onus is on retailers to prove that faults found within six months on purchases are not inherent.
- 5 Goods ordered online, by phone or post can be returned under the Distance Selling Regulations without explanation within a reasonable time – this is widely accepted as being seven days.
- 6 Open and inspect all goods as soon as possible after delivery and make sure they work.
- 7 Companies are not obliged to repair or replace goods damaged by accident or misuse, unless it is caused in transit by a delivery service.
- 8 Companies cannot charge for a service that isn't being delivered, but never stop a direct debit while under contract.
- 9 Consumers should not suffer financial loss for repairs that are not their fault, so claim back carriage charges.
- 10 If a dispute arises, take advice from Consumer Direct at www.consumerdirect.gov.uk.



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NEXT MONTH

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Free software

The big hitters of the free software world, such as Openoffice.org and Firefox, are well known – but there are hundreds of free applications available. In next month's issue, we'll be rounding up the best freeware.

Digital health

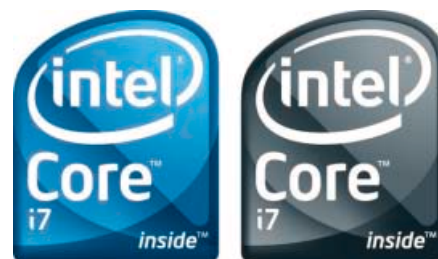
The worlds of health and computing are moving ever closer and blurring the boundaries between science fiction and fact. We look at the ways in which digital technology is being used, from remote monitoring applications that can alert doctors when a patient is in trouble, to mobility aids, such as a thought-controlled wheelchair.

3G broadband

If you can't get fixed-line broadband, or you simply need fast Internet access on the go, wireless broadband seems like the ideal solution. But just how fast is 3G broadband, how easy is it to set up, and what will it really cost? We put all the networks through their paces.

Core i7 PCs

Intel's new processor architecture promises another leap in performance. If you want the ultimate gaming experience, or the power to crunch through high-definition video editing, could it be the solution to your problems? In our group test, we look at some of the first systems to use the Core i7 chip, and bring you the inside information on the next generation of PCs.



**There's lots more in February's PCW
DON'T MISS IT...**

JANUARY 2004

From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

Megapixel counts were going up but the price of digital cameras was still way high by the standards of today. We concluded that Nikon's Coolpix 5400 offered the best quality but at £600 was the most expensive. It got a Highly Commended award. So did Canon's £349 Powershot A80 for its wealth of features at little more than half the price. Top spot went to the Kodak Easyshare DX6490, which could not quite match the Nikon's quality but cost £200 less.

64-bit, eh? Sounds so much better than 32-bit. Most of us are still running at 32-bit and don't notice the difference – well, those of us not running elephantine amounts of memory, that is. PCW's Alan Stevens wisely predicted the switch to 64-bit would be much slower than the momentous change from 8-bit to 16-bit that ushered in the graphical interface.



Flat-panel monitors and DVD burners still seemed a little luxurious just five years ago. PCW assured readers that finding a good deal on a high-performing PC with both was easier than they might think. We rounded up 14 costing less than £1,000.

We pitted Microsoft Office 2003 against the latest version of Star Office 7 and concluded that the latter offered a good alternative choice. As our review of Star Office stablemate Openoffice.org this month (page 66) shows, this battle is still raging – and the underdog is getting stronger.

JANUARY 1984

In January 1984 we were soliciting nominations for the 1984 British Microcomputing Awards (the forerunner of the PCW Awards). The name itself is a sign of the times: desktop PCs were known as micros, and it was only by a fluke or prescience that PCW (founded 1978) was not called Personal Microcomputing, or some such. Ironically, 'micro' was used originally to distinguish the machines from cupboard-size minis, while today the word 'mini' is being applied to the new ultraportables.

Machines entered for the Microcomputer of the Year Award had to cost less than £8,000, which is a measure of how much business machines cost. But the Commodore 64, BBC Micro, Atari and Oric were affordable for home users.

The IBM PC Junior, launched as this edition was being prepared, cost \$670 and had an infra-red cordless keyboard. It was dogged by technical problems and sales fell well short of the predicted three million.

Also doomed to fail was the AMS 3in drive, which we looked at as a possible replacement for the 5.25in floppy.



JANUARY 1994

Our cover featured Toshiba's first sub-notebook, a reminder of how much we take for granted today. It was the first with the luxury of a TFT colour screen and it had a luxurious price of £3,150, equivalent perhaps to twice as much in today's money.

CD-quality sound was becoming affordable and eight-bit soundcards were gradually being superseded by 16-bit models. We tested 15 of the latest cards, with the £199 16-bit Orchid Soundwave 32 scooping the prize for its support for various standards and excellent sound quality.

The month also saw the birth of PC firm Advent, which launched a 486SX-based desktop computer running at 25MHz with 4MB of Ram for £799.

Apple, strengthening its reputation as an innovative company, launched the first combined Mac and TV, available only in the US.

And Minolta signed up a certain Gary Lineker, complete with cheeky, not to say cheesy, grin to promote its latest range of Winlaser printers.



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